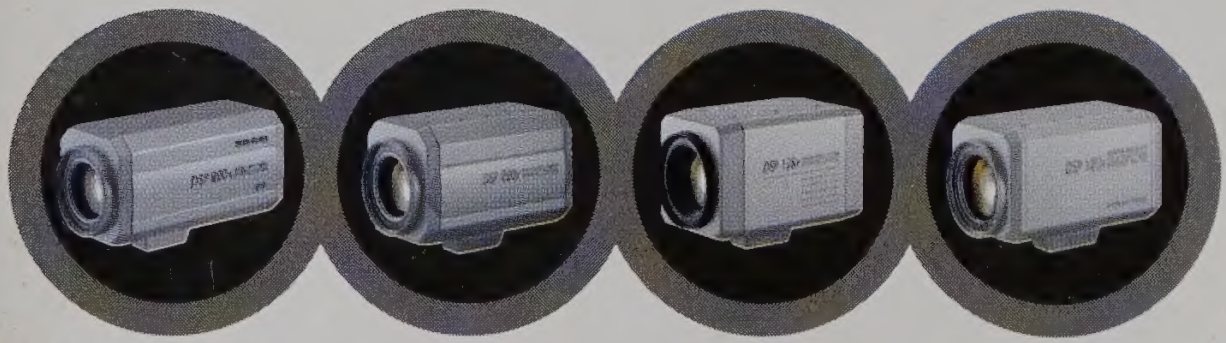


220X-DSP

COLOR ZOOM CAMERA SERIES
DIGITAL POWER ZOOM

OWNER'S MANUAL

DIGITAL

. User Information

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION! TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

Explanation of two Symbols

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of un-insulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance-(servicing) instructions in the literature accompanying the appliance.

THE GRAPHIC SYMBOLS WITH SUPPLEMENTAL MARKING ARE ON THE BOTTOM OF THE SYSTEM.

"WARNING-TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THE UNIT TO RAIN OR MOISTURE"

INFORMATION

This equipment has been tested and found to comply with limits for a Class A digital device, pursuant to part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

The manufacturer could void the user's authority to operate the equipment.

CAUTION - To prevent electric shock and risk of fire hazards:

- Do NOT use power sources except for that specified.
- Do NOT expose this appliance to rain or moisture.

This installation should be made by a qualified service person and should be confirmed to all local codes.

. Safety and Precautions

- **Avoid using the camera in extreme temperature environments.**
  Using the camera in temperatures exceeding 50°C or below -10°C may lessen picture quality or cause the camera to malfunction.

- **Avoid using the camera in high humidity environments.**
  Using the camera in places with high humidity may lessen picture quality because of moisture on the lens.

- **Avoid using the camera in unsteady lighting.**
  The camera will not work properly in places with great changes in illumination intensity, such as fluorescent lamps.

- **Make sure no foreign substances get on the front glass of the camera.**

  Do not disassemble the camera and prevent foreign substances from getting into the camera.

- **Make sure that the camera is not exposed to an intense light source such as direct sunlight.**
  It may damage the CCD.

- **Camera may be damaged if dropped or subjected to strong impact.**

- **Keep camera dry.**
  The camera will be damaged if immersed in water.

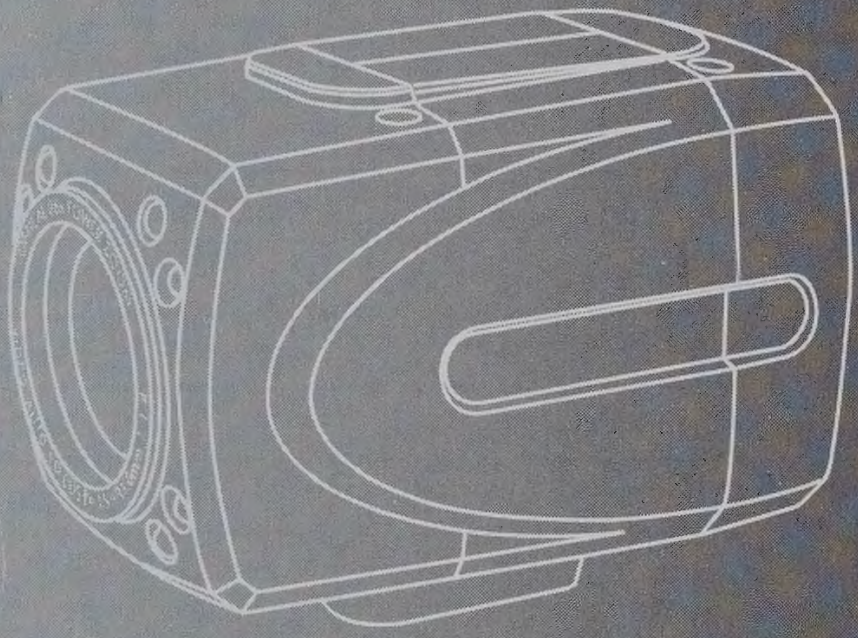
- **Avoid using the camera in the presence of oil and gas.**
  The camera will be damaged if oil or gas penetrates the exterior.

- **Caution**
  - Smear or blooming(when bright areas spreads out) may occur when photographing in strong light, i.e. car headlights, etc.
  - Make sure that you are using a compatible power adapter(DC12V, 500mA) before connecting it to the camera.
  - When the camera is used in a glass housing, the infrared ray may reflect off the glass.

COLOR VIDEO ZOOM CAMERA SERIES
DAY & NIGHT Function With ICR

OWNER'S MANUAL

260x POWER ZOOM
COLOR VIDEO CAMERA
DAY&NIGHT



. Model Description - 26x Series

Model	Signal System	DAY&NIGHT	IR LED	Communication System
IR LED / DAY & NIGHT Series	NTSC	0	0	PTZ Controller
	PAL	0	0	PTZ Controller
	NTSC	0	0	RS-232C
	PAL	0	0	RS-232C
	NTSC	0	0	RS-422/485
	PAL	0	0	RS-422/485
DAY & NIGHT Series	NTSC	0	X	PTZ Controller
	PAL	0	X	PTZ Controller
	NTSC	0	X	RS-232C
	PAL	0	X	RS-232C
	NTSC	0	X	RS-422/485
	PAL	0	X	RS-422/485
BASIC Series	NTSC	X	X	PTZ Controller
	PAL	X	X	PTZ Controller
	NTSC	X	X	RS-232C
	PAL	X	X	RS-232C
	NTSC	X	X	RS-422/485
	PAL	X	X	RS-422/485

. Contents

1. User Information 2

2. Safety and Precautions 4

3. Model Description 6

4. Features 8

5. Rear view and Part Names 9

6. Installation 10

7. On-Screen Display 16

8. Menus and Operations 18

9. Specifications 39

260x zoom

. Features

1. High-Resolution and High-Definition picture

Provides high-definition picture 480 TV line horizontal resolution, with 1/4 inch SONY Super HAD CCD.

2. Day & Night function

It automatically judges whether it is day or night to deiver the best pictures. Color pictures are provided during the day black and white pictures at night. A separate infrared ray LED is unnecessary since the built-in IR LED is used when the IR Cut Filter is removed at night.

- IR LED can be turned on or turned off in OSD MENU.
- IR LED is a model-specific option.

Caution: When using a glass housing, select a model without IR LED. Problems may occur on the screen when the infrared ray reflects off the housing glass.

3. High-Magnification Zoom function

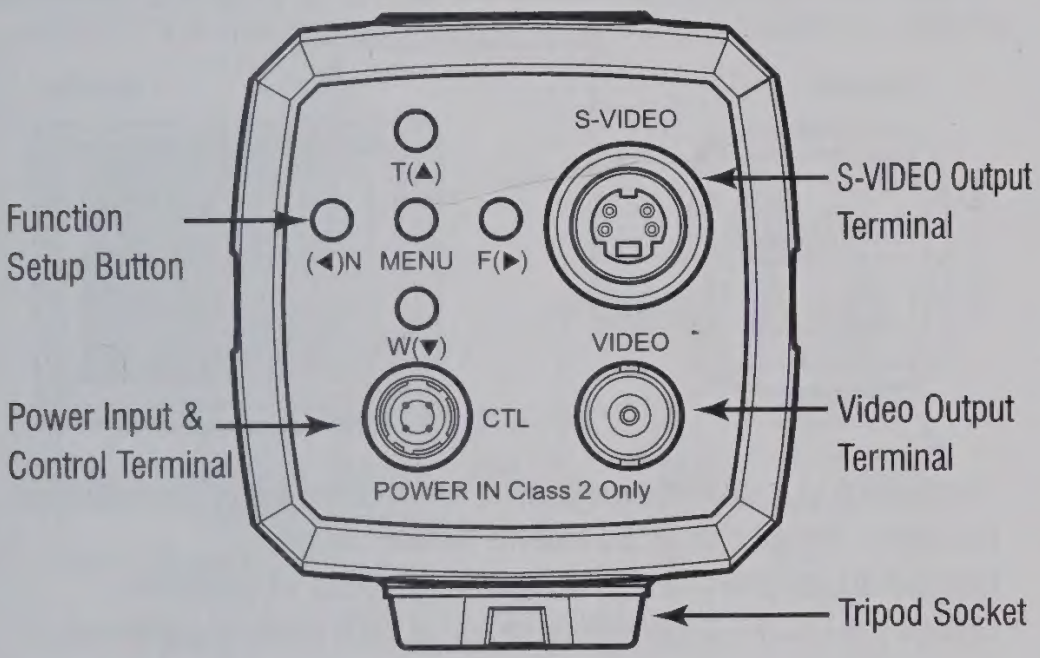
Subjects can be magnified up to 260 times with the 26x optical zoom and 10x digital zoom.

4. Convenient setup of function using menu

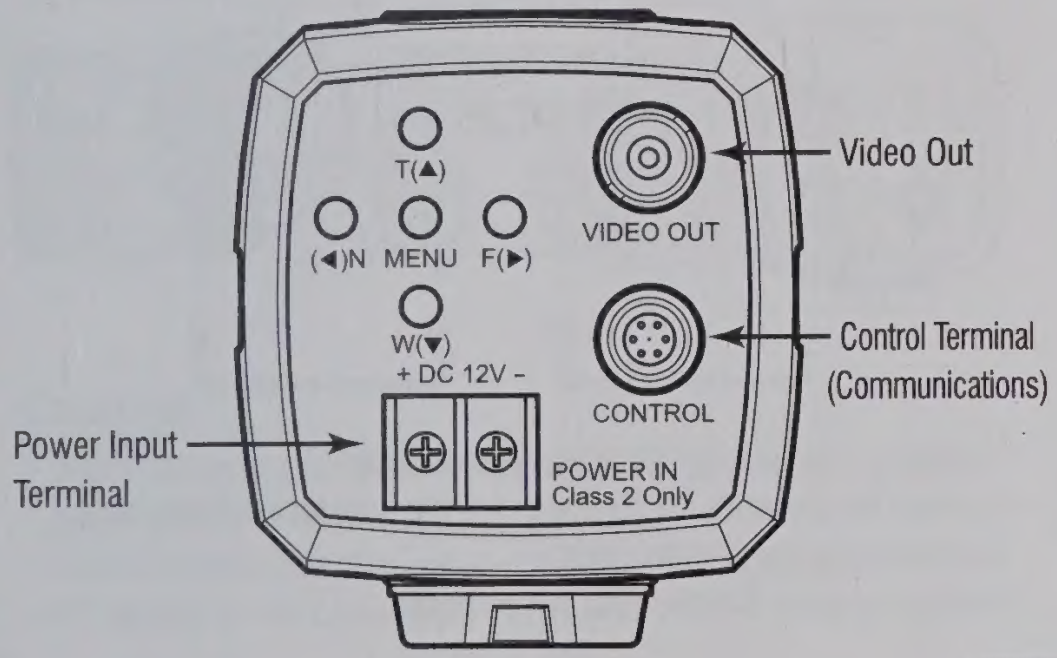
All camera operations can be controlled with the MENU buttons.

. Rear View and Prat Names

<Controller Model>



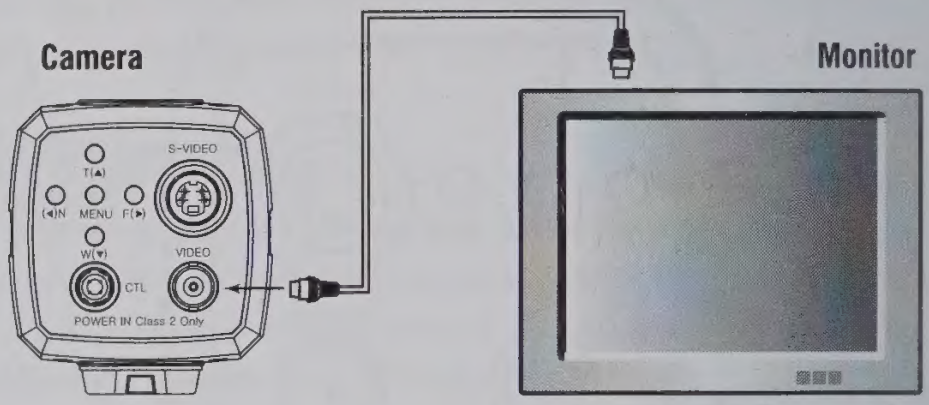
<RS-232C/ RS-422 Communication Model>



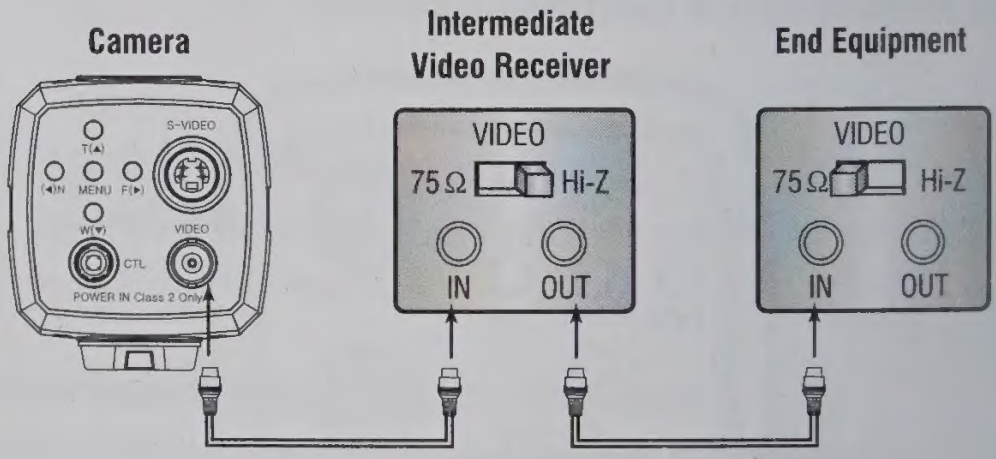
260x zoom

■ Connecting to Monitor

Connect the video output terminal on the back of the product to the monitor.



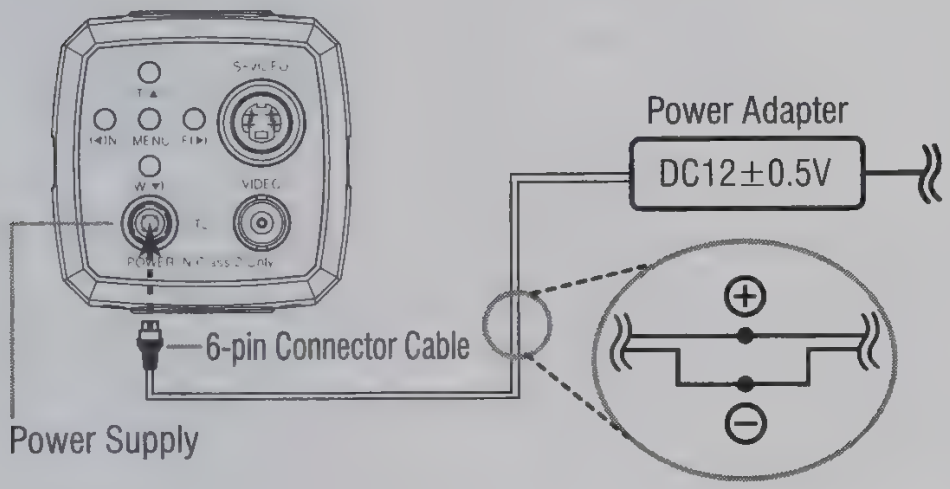
- The method of connecting the camera to a monitor varies depending on the model. Please refer to the manual for your model.
- Connect the camera after switching off each piece of equipment.
- Change the 75Ω/Hi-Z conversion switch of each piece of equipment according to the following diagram- move the switch of the intermediate video receiver to Hi-Z, and the end equipment to 75Ω.



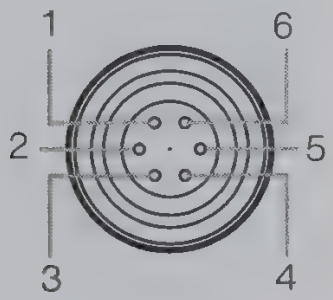
- Connect the S-Video terminal to a color monitor.
- Connect the camera's S-Video output to the monitor's S-Video input terminal using the S-Video cable.
- Set the monitor's S-Video 75Ω switch to ON.

■ Connecting Power (For Controller Model)

Connect Pin 5 (Black: GND) and Pin 6 (Red: DC12V) of the 6-pin connector cable to the output of power adapter according to the following diagram.



• **Pin Configuration of 6-pin Circular Connector**



[6-pin Circular Connector Pins]

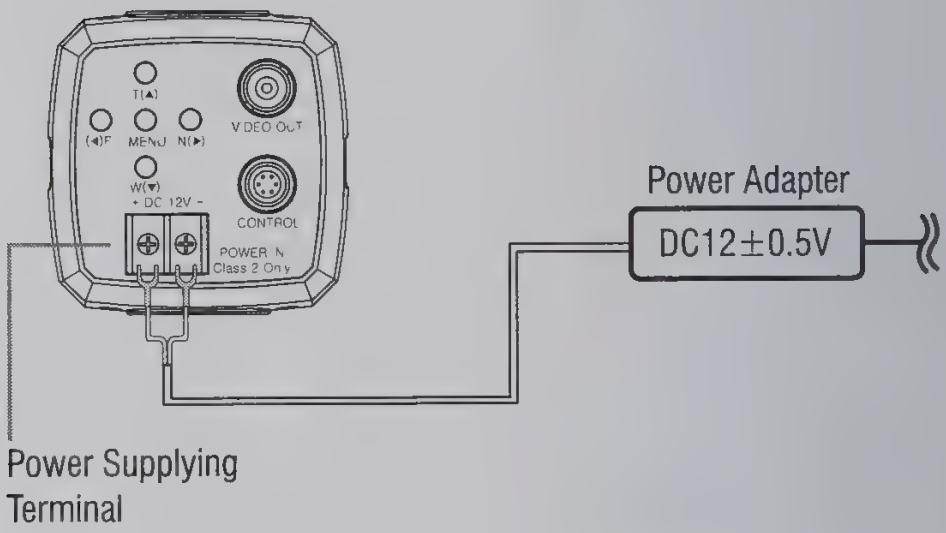
Pin. No	Color
1	Green
2	White
3	Brown/Blue
4	Yellow
5	Black
6	Red

Caution

- When connecting to the power source, make sure the polarity of the power adapter is correct.
- Connect power only after installation has been completed.
- AC adapter is sold separately.

■ Connecting Power
(For RS-232C/ RS-422 Communication Model)

Connect the AC adapter output to the power input terminal of the camera according to the following diagram.



Caution

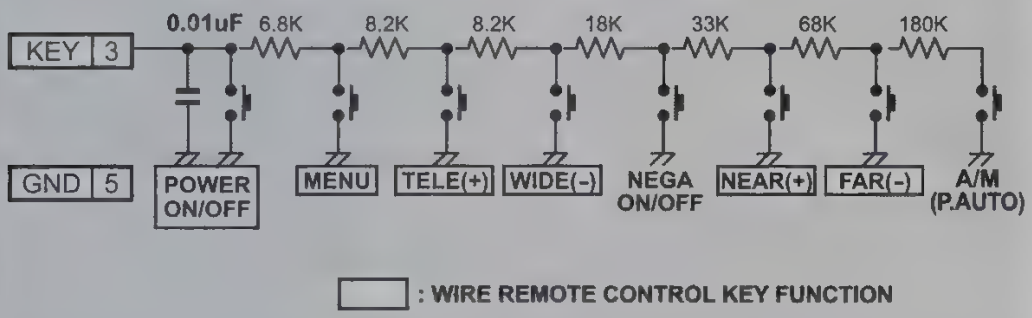
- When connecting to the power source, make sure the polarity of the power adapter is correct.
- Connect power only after installation has been completed.
- AC adapter is sold separately.

■ Connecting 6-pin Connector (For Controller Model)

Pin.No.	NAME	I/O	Color	Note
1	ZOOM (+:Tele, -:Wide)	Input	Green	±6V(Limit +3~13V, -3~-13V)
2	FOCUS (+:Near, -:Far)	Input	White	±6V(Limit +3~13V, -3~-13V)
3	KEY	Input	Brown	or Blue
4	COM(For Zoom, Focus)		Yellow	
5	GND (For Power)		Black	
6	DC IN	Input	Red	DC 12±0.5V

Link pins 1, 2, and 4 as in the above table,
when using pan/tilt, zoom controller.

- **Connecting KEY:**
  The following KEY circuit can be configured and used.



- The 6-pin connector can be controlled by connecting the external wired remote control.
- An optional external wired remote controller is provided.
- There are two types of external wired remote controller- 1.5m and 30m.

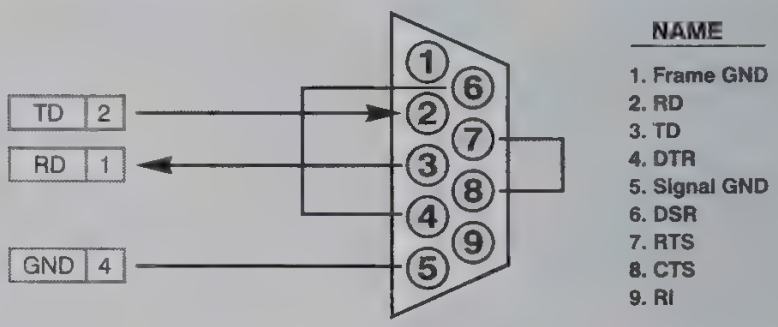
260x zoom

■ Connecting 6-pin Connector (For RS-232C Model)

Pin.No.	NAME	I/O	Color	Note
1	RD (For RS-232C)	Input	Green	+12V ~ -12V
2	TD (For RS-232C	Output	White	+12V ~ -12V
3	KEY	Input	Brown	or Blue
4	GND		Yellow	
5	GND		Black	
6	Line IN	Input	Red	EX. VD (Negative. 5Vp-p)

- RS-232C communication model can be controlled by connecting pins 1, 2 and 4 to the PC as shown in the above table.
- The operating S/W is not provided. Configure the S/W using the protocol provided by our company.

• Connecting to PC



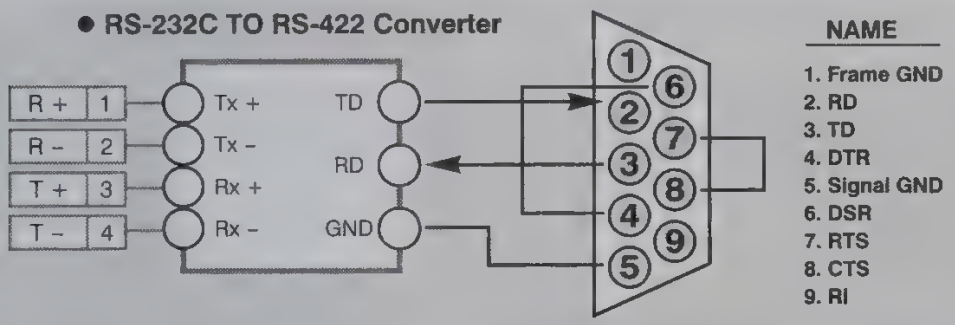
● RS-232C D-Sub Connector

■ Connecting 6-pin Connector (For RS-422 Model/ RS-485 Model)

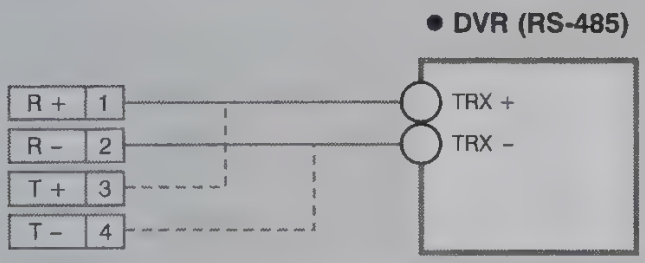
Pin.No.	NAME	I/O	Color	Note
1	R+	Input	Green	
2	R−	Input	White	
3	T+	Output	Brown	or Blue
4	T−	Output	Yellow	
5	GND		Black	
6	Line IN	Input	Red	EX. VD (Negative. 5Vp-p)

- RS-422 communications model can be used by connecting pins 1, 2, 3 and 4 in the following diagram.
- The operating S/W is not provided. Configure the S/W using the protocol provided by our company.

• Connecting to PC (RS-422 Communication)



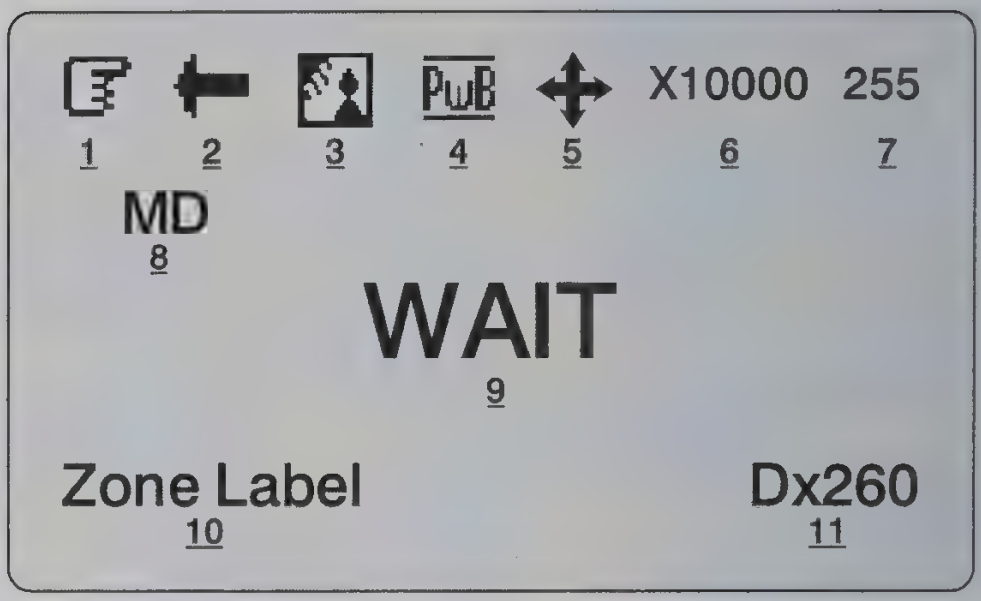
• Connecting to DVR (RS-485)



260x zoom

■ Explanation of the On-Screen Display

The OSD (On Screen Display) is as follows:



"ND": No Display

	FUNCTION	OSD	EXPLANATION
1	Focus	ND	Automatic focus mode
			Manual focus mode
2	Mirror	ND	No screen inverted
			Screen is inverted to the left or right
3	Backlight	ND	Backlight Compensation off
			Backlight Compensation mode
			Automatic backlight Compensation mode

"ND": No Display

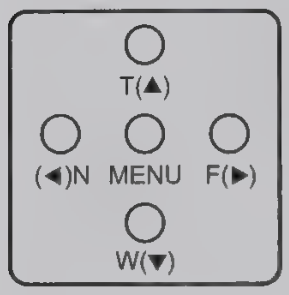
	FUNCTION	OSD	EXPLANATION
4	White Balance	ND	Automatic color Correction mode
		SwB	Special color Correction mode
		IwB	Indoor mode
		OwB	Outdoor mode
		PwB	Temporary automatic mode
5	Pan / Tilt	ND	No Act Digital Planning / Tilting
			Digital Planning / Tilting
6	Shutter Speed	ND	Standard shutter speed (NTSC:1/60, PAL:1/50)
		F.L	Flicker Correction mode
		x125 ~ x10000	Shutter speed indicator
7	ID	000 ~ 255	Camera identification number
8	Motion Detect	ND	No motion detected
		MD	Motion detected
9	Initial LOGO	WAIT	Displayed when POWER ON of the camera is in operation
10	Zone Label	-	Explanation of the scene capture by the camera (max. 10 letters)
11	Zoom	x1 ··· Dx260	Optical zoom: x1 ~ x26 Digital zoom: Dx27 ~ Dx260 * 'D' indicates digital zoom

260x zoom

. Menus and Operations

■ How to Set Up Functions

Functions can be setup using 5 buttons on the camera's rear panel.

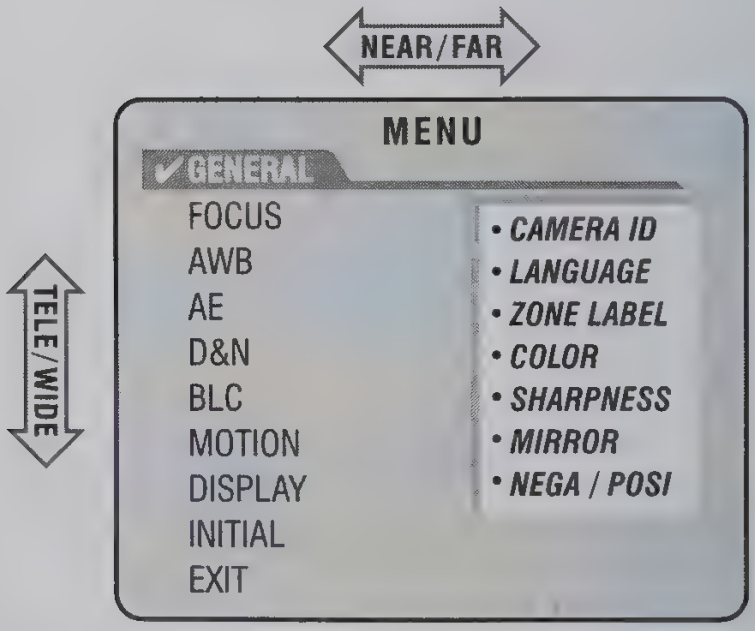


- ➲ MENU Key : Shows/Hides Menu
- ➲ TELE/WIDE : Moves up and down items
- ➲ NEAR/FAR : Set data for the selected item

(*) The above keys may be used differently in some functions : 'Zone Label'

1. Press the MENU button.

- ➲ The Menu consists of the "Main Menu" and "Sub-Menu".
- ➲ The main menu is displayed where 10 camera functions can be selected.
- ➲ To the right of each main menu selection, the sub-menu is displayed.

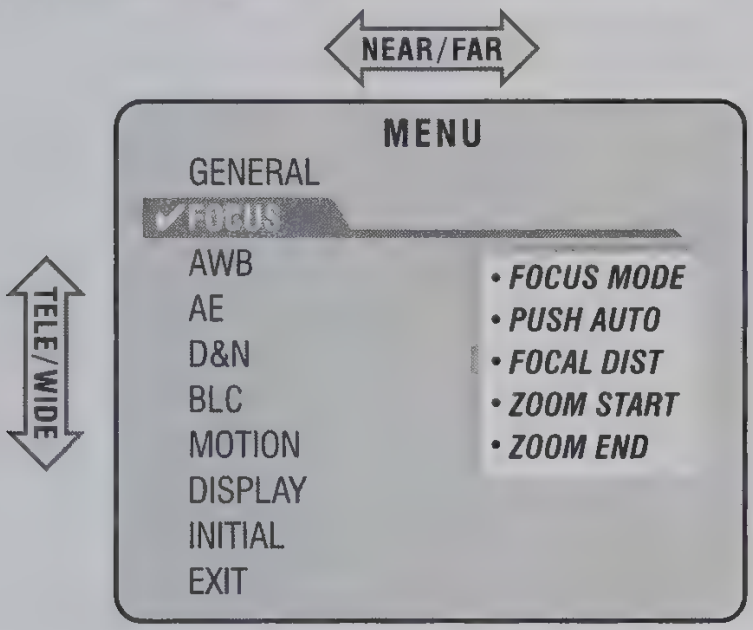


✔GENERAL

: This blinks to show that this category has been selected.

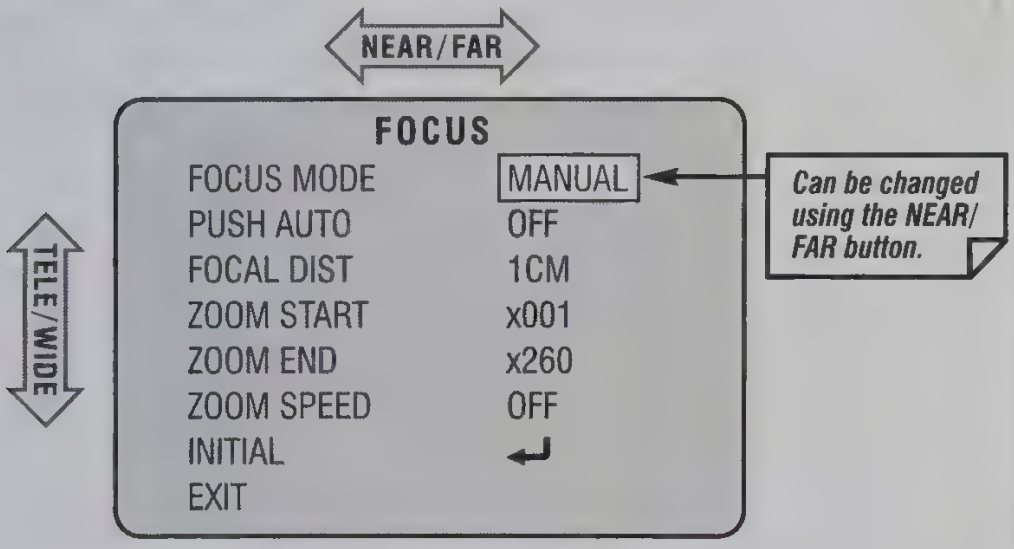
2. Press the TELE/WIDE button.

- It moves up and down the main menu category.
- The sub-menu functions of the main menu category are displayed on the right.



3. Press the NEAR/FAR button.

- It moves to the sub-menu window of the selected main menu.
- The current set state of each sub-menu can be checked.
- Press the TELE/WIDE button to move up and down the sub-menu category and set each category by pressing the NEAR/FAR button.

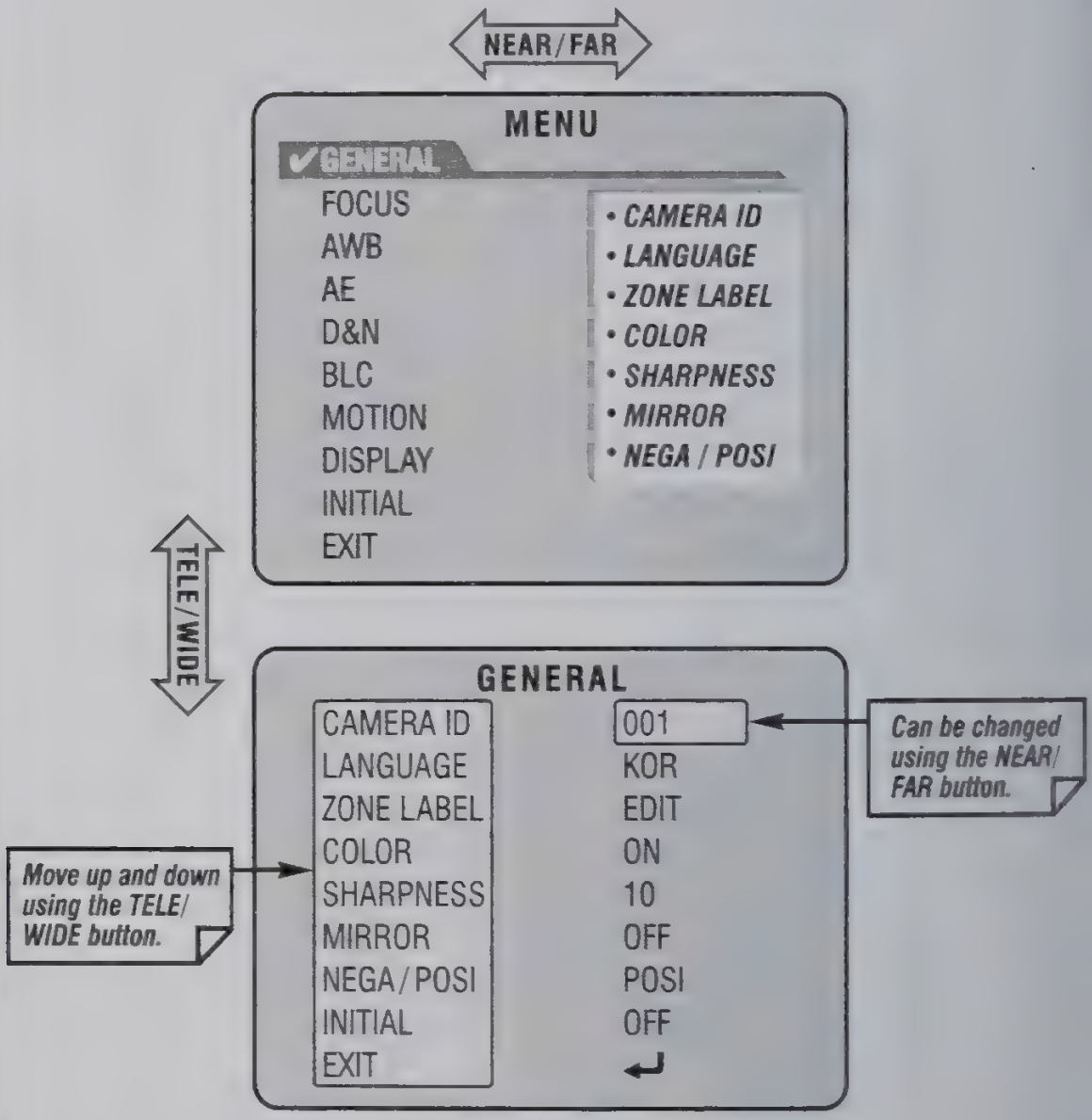


4. Press the OSD MENU button at the main menu or sub-menu screen to hide the menu.

- It does not apply when the MENU button is used for other uses.
  : 'Zone Label' setup screen

■ Main Menu- GENERAL

- Sets up the general operation of the camera.
- Press the NEAR/FAR button to move to the sub-menu.



1. CAMERA ID

- Displays the camera's ID.
- Camera ID can be specified using numbers from 000 to 255 by using the Near/Far button.

2. LANGUAGE

- ➲ Displays the currently set language.
- ➲ Language can be set from ENG to KOR and vice versa using the NEAR/FAR button.

3. ZONE LABEL

- ➲ Edits and displays the information of camera or explanation on the area of the image being captured at the bottom left of the screen.
- ➲ Maximum of 10 letters can be used/edited.
- ➲ It is described in detail on Page 35.

4. COLOR

- ➲ Selects color or black and white mode.

5. SHARPNESS

- ➲ Adjusts sharpness of outlines.
- ➲ Can be set from 0 to 15.

6. MIRROR

- ➲ Inverts the screen to the right or left.

7. NEGA/POSI

- ➲ Selects positive or negative.

8. INITIAL

- ➲ Resets the current general settings category to the initial settings.

9. EXIT

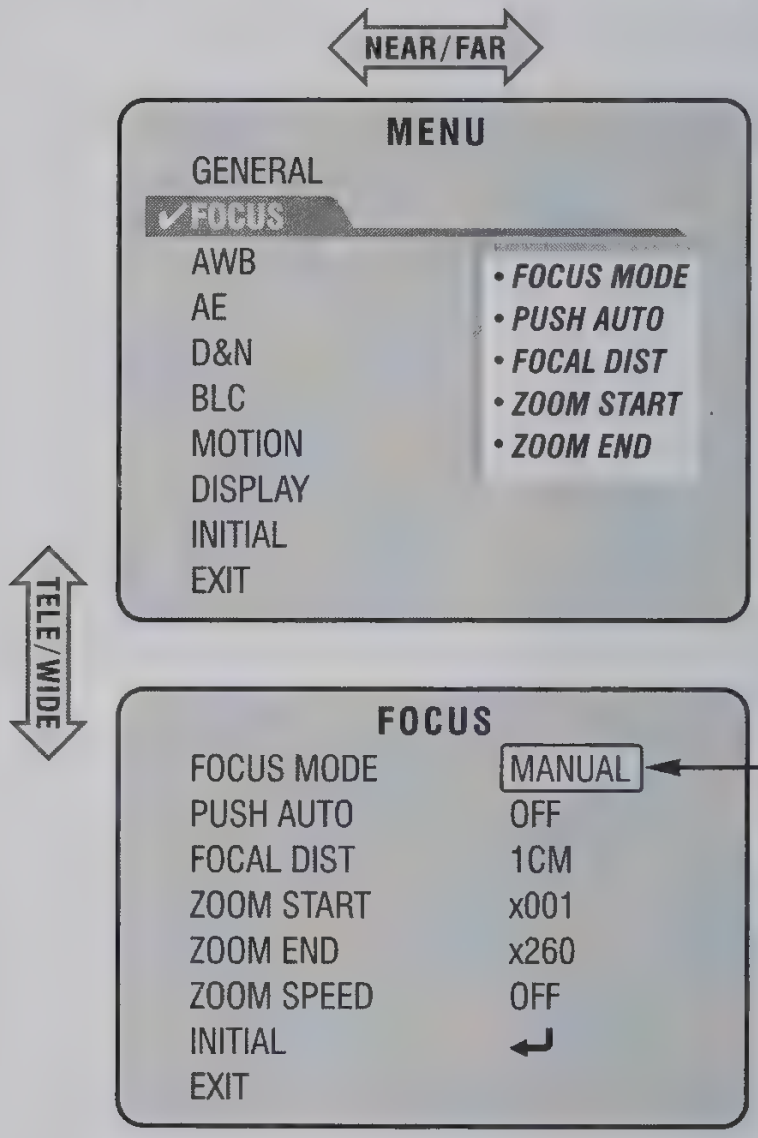
- ➲ Closes the sub-menu and moves to the main menu.

Caution

- Change the data of the sub-menu using the NEAR/FAR button.

■ Main Menu- FOCUS

➲ Sets camera zoom and focus.
➲ Press the NEAR/FAR button to move to the sub-menu.



1. FOCUS MODE

➲ AUTO: Focuses automatically when changes are made to the screen.
➲ MANUAL: User focuses manually.

Note) Automatic focus in manual mode is only possible when the location of the zoom lens has changed or when the "temporary automatic focus" category is selected. Automatic focus is also possible based on external AF command (1 shot AF).

2. PUSH AUTO

- When Temporary Automatic Focus is selected, the camera focuses automatically when only the NEAR/FAR button is pressed.
- In the Automatic Mode, it will be displayed as "Not Used".

3. FOCAL DIST

- Minimum distance the camera can focus.
  ex) 10 cm : Objects/subjects closer than 10 cm cannot be brought into focus.

4. ZOOM START

- Minimum zoom movement.
- Possible from x 001 to x 260

5. ZOOM END

- Maximum zoom movement.
- Possible from x 001 to x 260

6. INITIAL

- Initializes changed category in Focus Menu.

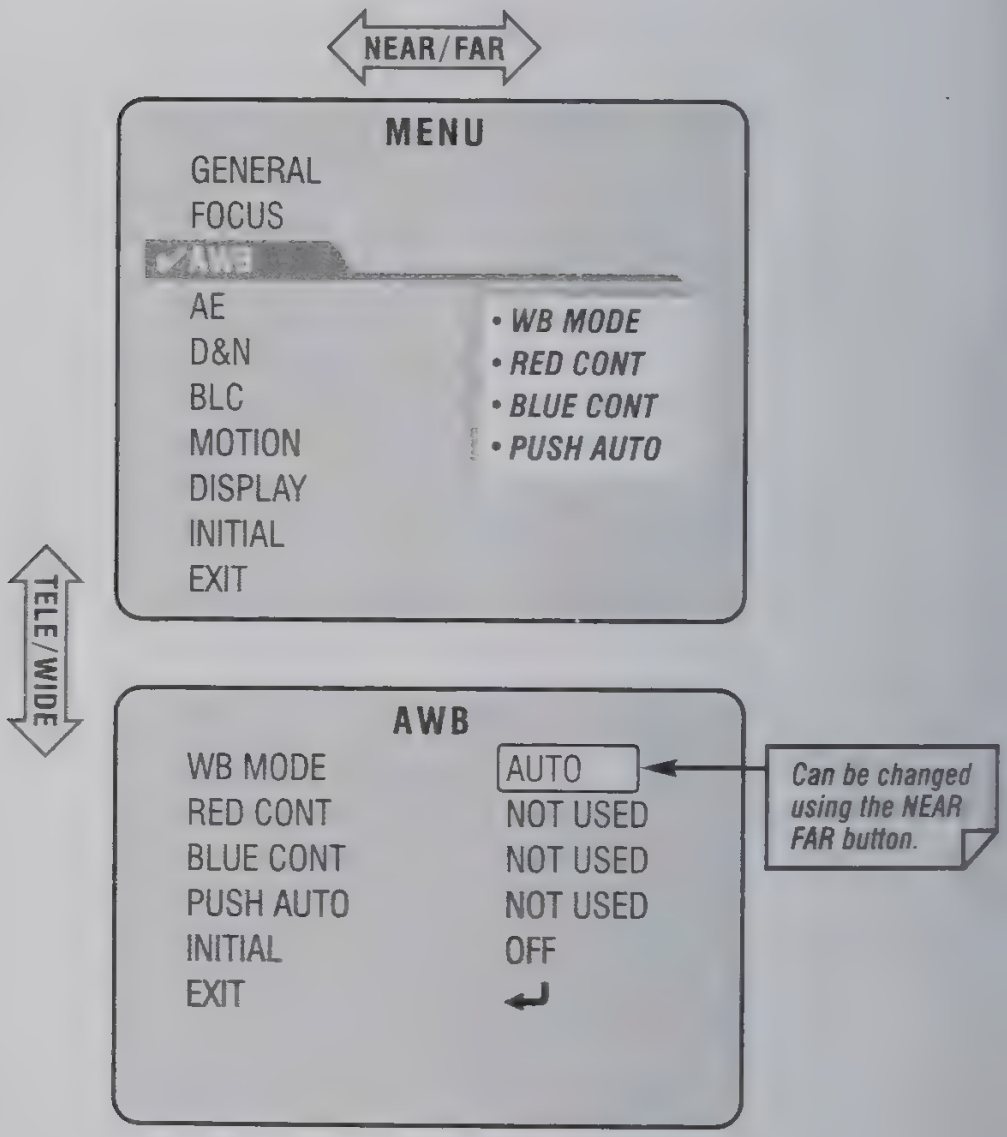
7. EXIT

- Closes the sub-menu and moves to the main menu.

■ Main Menu- AWB

➲ Adjusts picture color.

➲ Press the Near/Far button to move to the sub-menu.



1. AWB

- AUTO : Automatically adjusts color according to the available lighting.
- PUSH AUTO : Color will be automatically adjusted while the NEAR/FAR button is pressed in the Temporary Automatic mode.
- INDOOR : Set Color Temperature to be 3200 K.
- OUTDOOR : Set Color Temperature to be 5400 K.
- SPECIAL : Color can be corrected when the user increases or decreases "Red Correction" or "Blue Correction".

2. RED CONT

- Can be changed in Special Mode only, and R-Gain value is adjusted.
- Can be set from 0 to 255.

3. BLUE CONT

- Can be changed in Special Mode only, and B-Gain value is adjusted.
- Can be set from 0 to 255.

4. PUSH AUTO

- Can be used in Temporary Automatic Mode only.
- Color will be automatically adjusted while the NEAR/FAR button is pressed at Temporary Automatic mode. (the word "Pressed" will be displayed.)

5. INITIAL

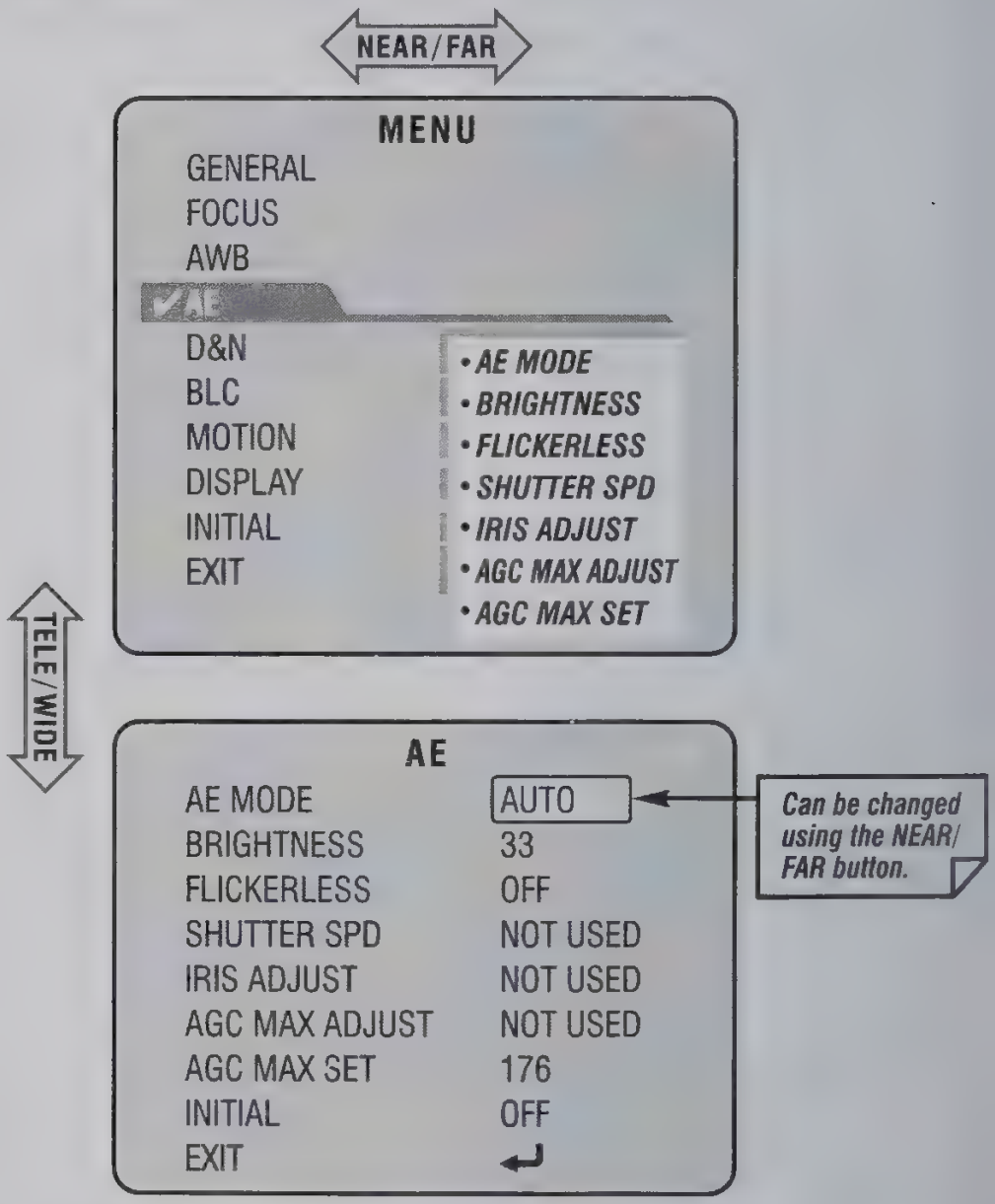
- Initializes changed category in Color Correction Menu.

6. EXIT

- Closes the sub-menu and moves to the main menu.

■ Main Menu- AE

- Adjusts picture brightness.
- Press the Near/Far button to move to the sub-menu.



1. AE MODE

- AUTO : Automatically adjusts brightness according to the available lighting.
- MANUAL : Manually adjusts all brightness.
- AGC MAN : Allows you to adjust gain.
- IRIS MAN : Allows you to adjust iris.
- SHUT MAN : Allows you to adjust the shutter speed.

2. BRIGHTNESS

- Brightness can be adjusted from 0 (dark) to 48 (bright).
- Can be used while in Manual Mode.

3. FLICKERLESS

- Removes screen flickering caused by discordance of frequency and lighting.

4. SHUTTER SPD

- Can be changed while in Manual and Shutter Manual mode.
- Shutter speed can be changed from standard to 1/10000.
- Standard shutter speed: NTSC- 1/60, PAL- 1/50.

5. IRIS ADJUST

- Adjusts the opening of iris.
- Can be adjusted from 0 (closed) to 255 (opened).
- Change in screen can be recognized only within the certain range.
- Can be adjusted while in Manual and Gain Adjustment mode.

6. AGC ADJUST

- Gain adjustment of image signal.
- Can be adjusted from 0 to 255.
- Change in screen cannot be recognized only within the certain range.
- Can be adjusted while in Manual and Gain Adjustment mode.

7. AGC MAX SET

- Maximum Gain value used when Gain is automatic.
- Can be adjusted from 0 to 255.

8. INITIAL

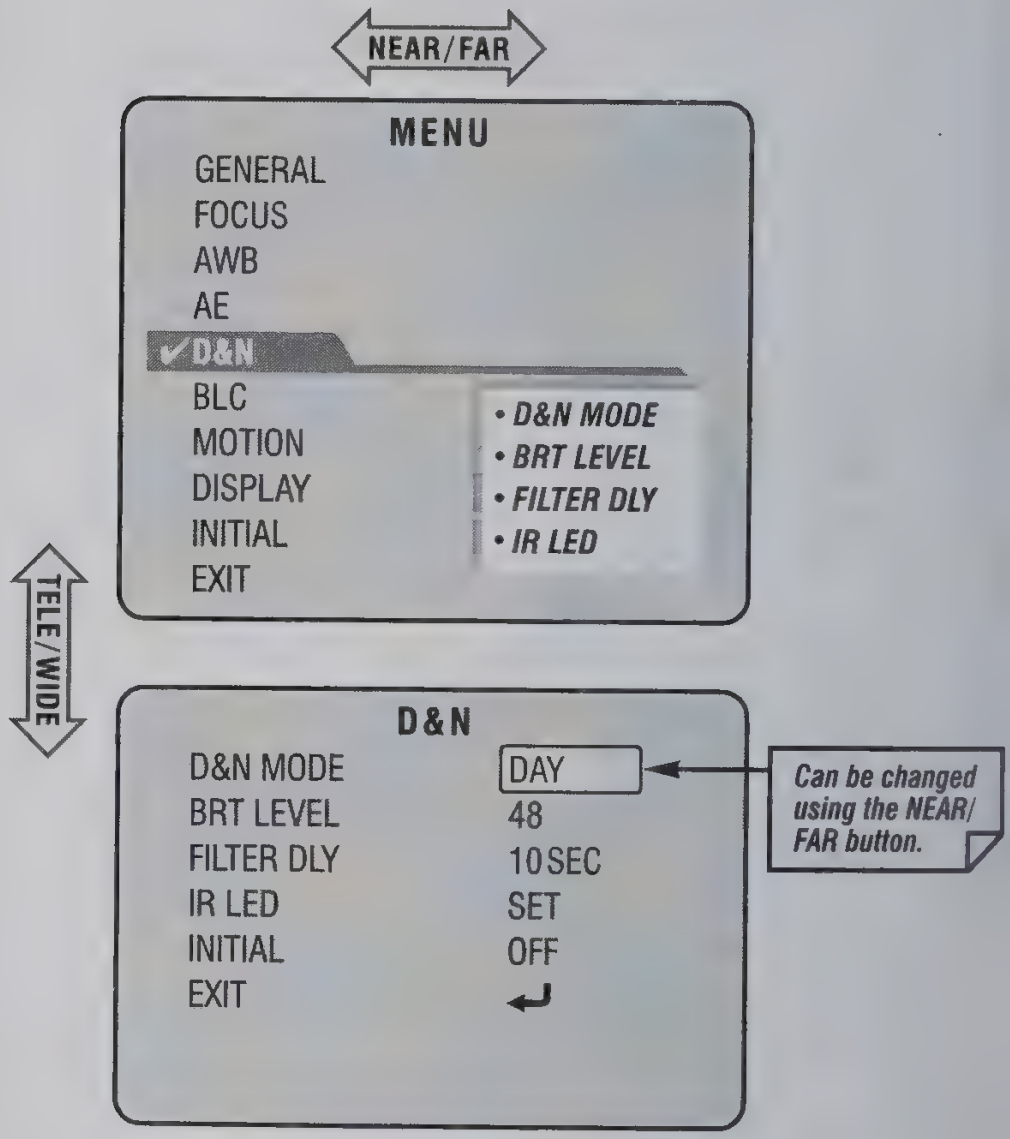
- Initializes the changed category in Exposure Menu to the initial settings.

9. EXIT

- Closes the sub-menu and moves to the main menu.

■ Main Menu- D & N

- ➲ Determines and operates in mode suitable for day or night.
- ➲ Press the NEAR/FAR button to move to the sub-menu.



1. D&N MODE

- AUTO : Filter operates automatically according to brightness.
- NIGHT : Manual Mode- removes IR cut filter.
- DAY : Manual Mode- does not remove IR cut filter.

2. BRT LEVEL

- Sets brightness that determines the opening/closing or IR cut filter while in Automatic Mode.
- Screen brightness can be adjusted from 0 (bright) to 200 (dark).
- Please set up the level higher when you install this camera into the housing.

3. FILTER DLY

- Sets conversion time of IR cut filter while in Automatic Mode.
- Time can be adjusted from 0 to 60 seconds.

4. IR LED

- Determines whether IR LED light will be on/off at night, for use of external IR LED lamp when there is diffusion of IR on the dome glass in front of the camera.
- SET : uses built-in IR LED in night state.
- UNSET : does not use built-in IR LED in night state.

5. INITIAL

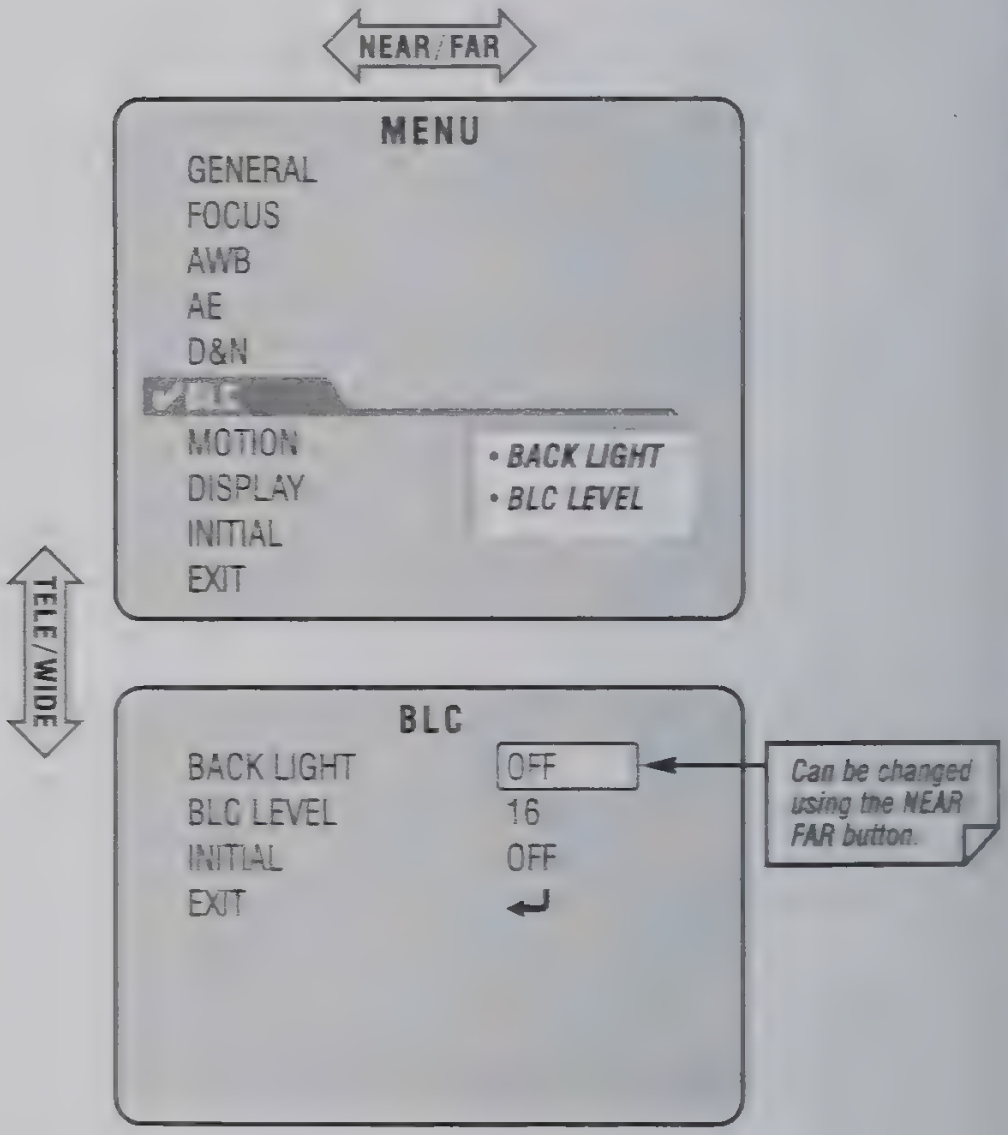
- Initializes changed category in Night Image Capture Menu.

6. EXIT

- Closes the sub-menu and moves to the main menu.

■ Main Menu- BLC

- ➲ Function that sharpens outlines of subjects and background when there is strong backlight.
- ➲ Press the Near Far button to move to the sub-menu.



1. BLC MODE

- ➲ Sharpens subjects with backlight.
- ➲ OFF : Backlight Correction function is disabled.
- ➲ ON : Backlight Correction function is enabled.
- ➲ AUTO : Backlight Correction function is enabled automatically.

2. BLC LEVEL

- ➲ Sets sensitivity to backlight.
- ➲ Can be adjusted from 0 to 40.

3. INITIAL

- ➲ Initializes changed category in Color Correction Menu.

4. EXIT

- ➲ Closes the sub-menu and moves to the main menu.

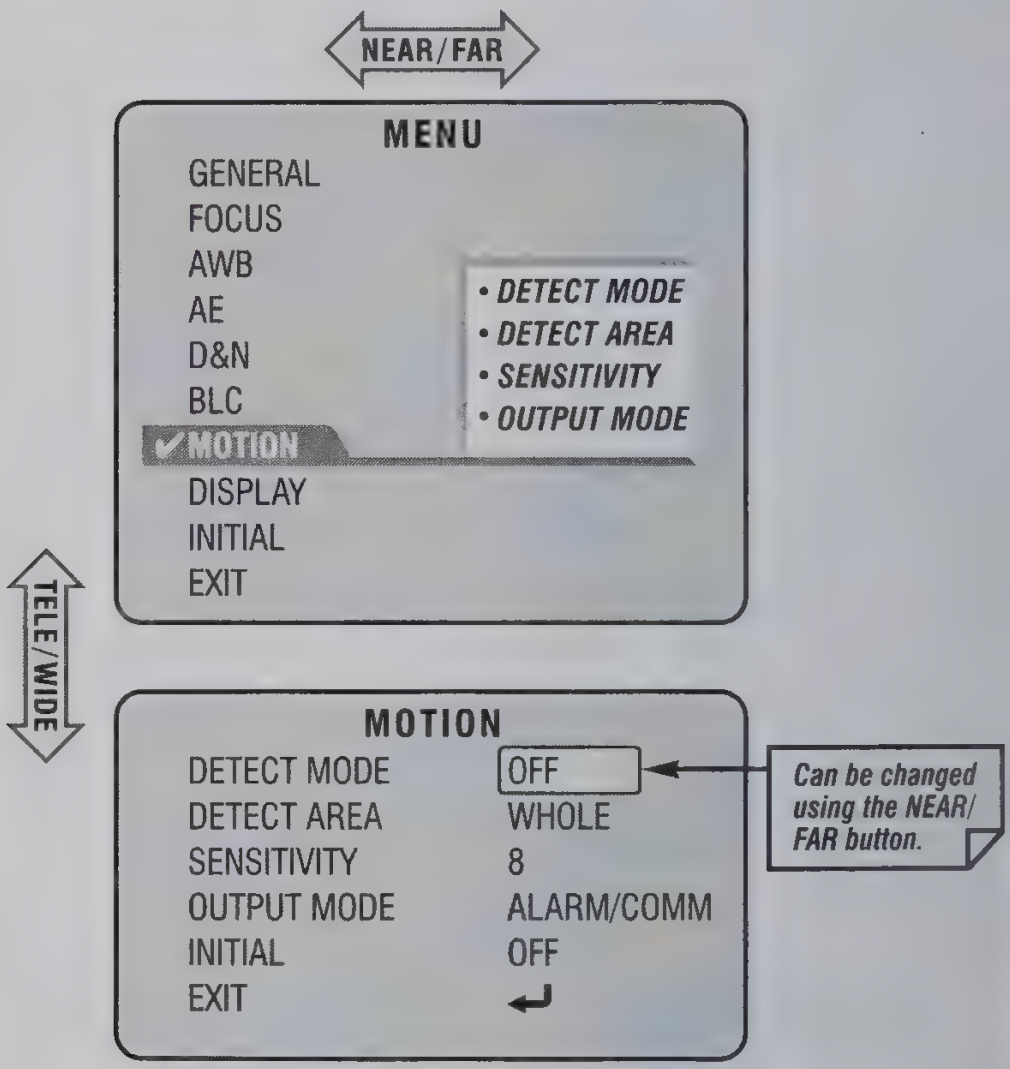
Note) BLC (Backlight Correction): Function that sharpens subjects only.

Caution

• It may not function properly when Shutter Speed is not 'standard'.

■ Main Menu- MOTION

- When there is movement of the subject in the screen, there will be an alarm, or the user will be informed through communications or "MD" will display on the screen.
- Press the NEAR/FAR button to move to the sub-menu.



1. DETECT MODE

- Enables or disables motion detection function.

2. DETECT AREA

- Sets motion detection field.
- Can be set to UPPER, LOWER, RIGHT, LEFT, CENTER and WHOLE.

3. SENSITIVITY

- ➲ Sets sensitivity to detect movement.
- ➲ Can be set from 1 (low response) to 15 (sensitive).

4. OUTPUT MODE (For RS-422 Model)

- ➲ Informs detection when motion has been detected.
- ➲ ALARM : Sends alarm using the output line connected to outside.
- ➲ COMM : Communication packet is transmitted when motion is detected.
- ➲ ALARM/COMM : Uses communications packet and external output line simultaneously.

5. INITIAL

- ➲ Initializes changed category in Motion Detection Menu.

6. EXIT

- ➲ Closes the sub-menu and moves to the main menu.

Note) There is a signal every time there is movement by the subject. If motion is detected, MD (Motion Detected) is displayed on the upper left of the screen. This message enables the user to set On-Screen Display state in the menu.

Caution

• Error can occur in the motion detection function in the following cases.
(1) When lighting is unsteady.
(2) When light changes often even though there is no movement of the subject.

It is recommended that this function should be used after setting the detection sensitivity and detection field after videoing the environment for an extended time.

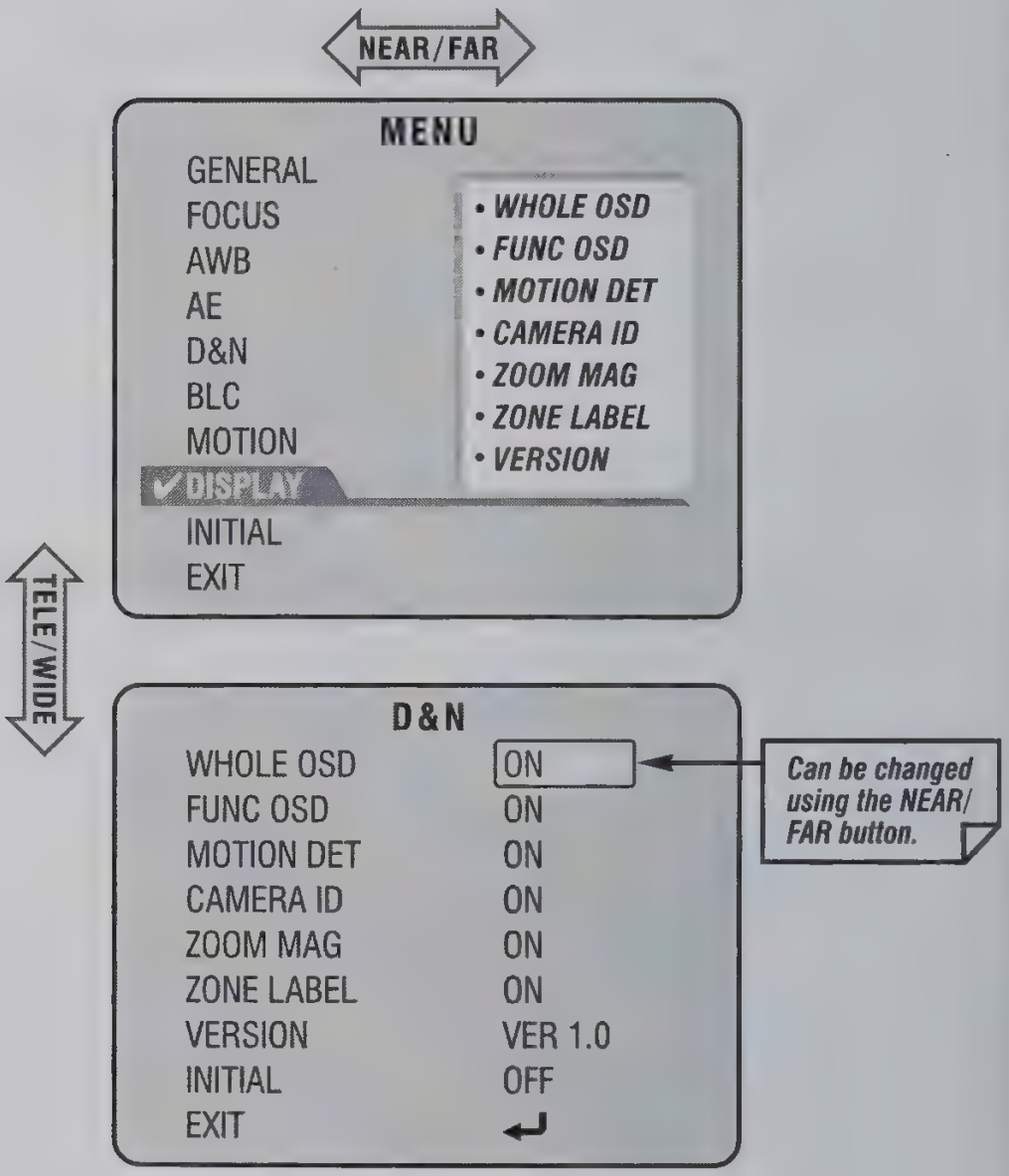
Note) BLC (Backlight Correction): Function that sharpens subjects only.

WHOLE

UPPER		
LEFT	CENTER	RIGHT
LOWER		

■ Main Menu- DISPLAY

➲ Specifies what to display on the screen.
➲ Press the NEAR/FAR button to move to the sub-menu.



1. WHOLE OSD

- ➲ All on-screen display is "ON" or "OFF".
- ➲ Nothing will be displayed if specified as "Hidden" even when other categories are individually set as "ON". (Exception: Initial Logo when power is turned on.)

2. FUNC OSD

- ➲ Images displayed on the upper area of the screen.
  Refer to the "On-Screen Display" section- images 1 to 6.

3. MOTION DET

- ➲ "MD" is displayed on the upper left of the screen when motion is detected.

4. CAMERA ID

- ➲ Displays ID number on the upper right of the screen.

5. ZOOM MAG

- ➲ Displays zoom on lower right of the screen.
- ➲ The number in Dx260 shows the magnification, and D represents Digital Zoom.

6. ZONE LABEL

- ➲ Displays texts explaining screen area on the lower left of the screen.

7. VERSION

- ➲ Displays the version information of camera (cannot be changed).

8. INITIAL

- ➲ Initializes changed category in On-Screen Display Menu.

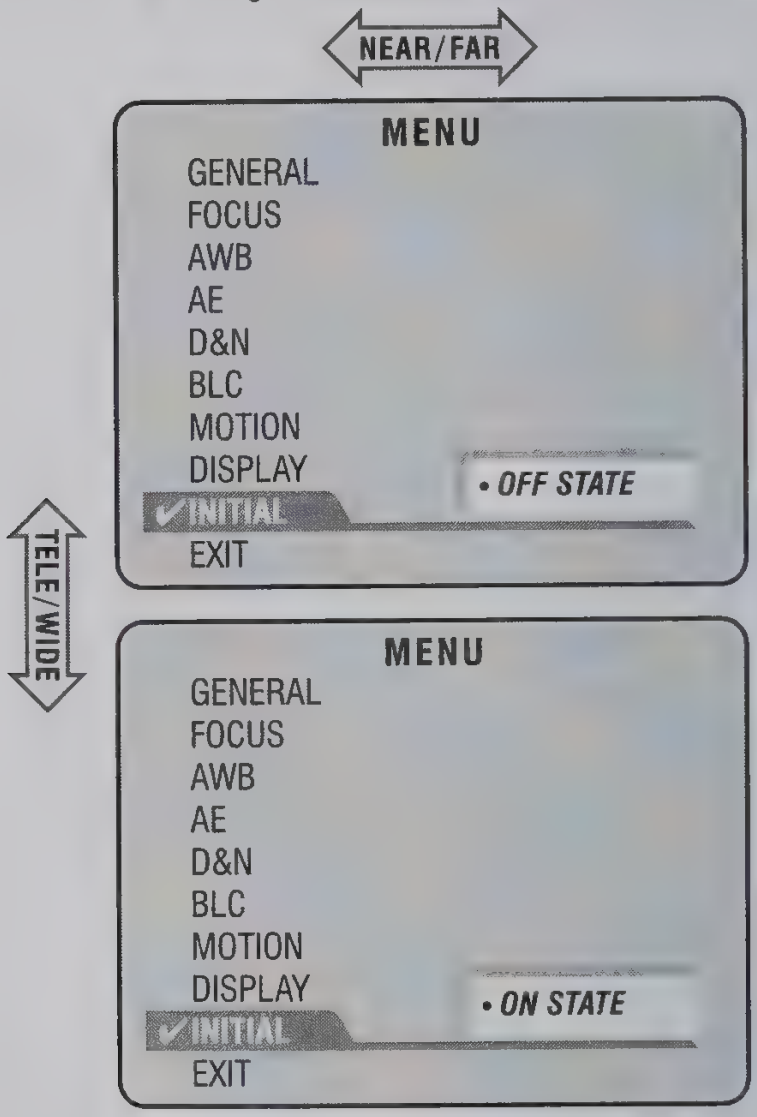
9. EXIT

- ➲ Closes the sub-menu and moves to the main menu.

Note) Refer to the "On-Screen Display" for details.

■ Main Menu- INITIAL

- ➲ Initializes all current settings.
- ➲ No sub-menu.
- ➲ Press the NEAR/FAR button to initialize the entire camera settings.
- ➲ Note that all settings in the sub-menus will be initialized.



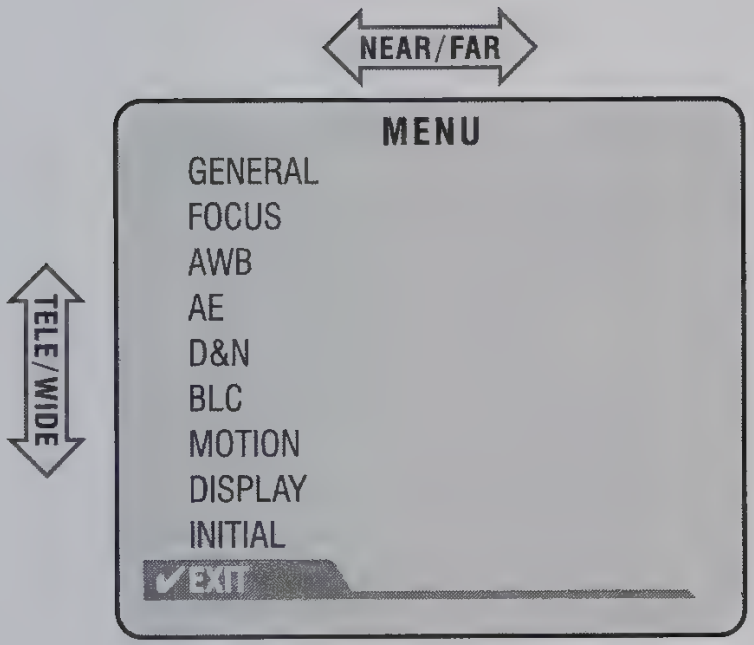
- ➲ OFF STATE : Indicates that settings are not initialized.
- ➲ ON STATE : Indicates that camera settings have been initialized.

Caution

Please use caution when performing this function.
Every setting(even in all sub-menus)will be initialized.
Initialization in sub-menus will initialize each category of the sub-menu only.

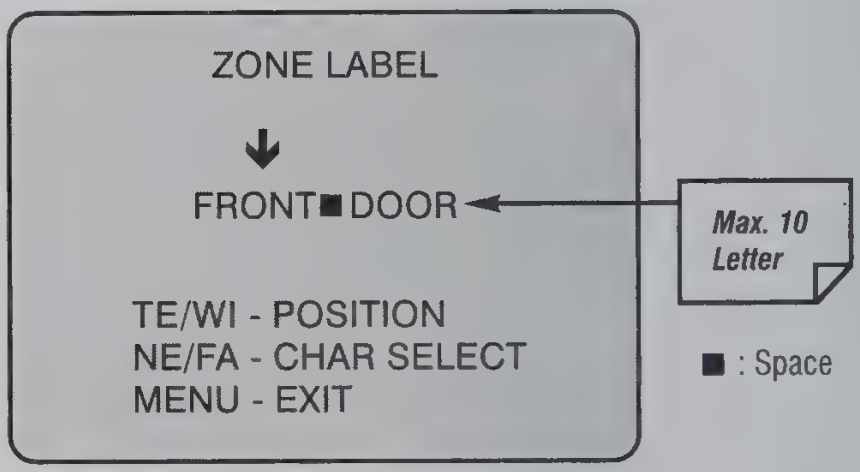
■ Main Menu- EXIT

- ➲ Closes menu.
- ➲ Press the NEAR/FAR button to close menu.



■ ZONE LABEL

➲ User can edit explanation or condition of camera, and this will be displayed on the lower left screen.



1. You can choose up to 84 symbols from the available symbols table.

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Y	Z	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
p	q	r	s	t	u	v	w	x	y	z	~	!	#	*	–	+
/	:	;	?	.		_	(	)	&	%	↑	↓	→	←	■	NU

2. Select the location of letters using the TELE/WIDE button.
   A downward arrow will blink on top of the letter to edit.

3. Select letters using the NEAR/FAR button.

4. To exit, press the MENU.

Caution) ■: denotes a blank letter and will be displayed as a blank space on the actual screen.

. Specifications

Signal System	NTSC	PAL
Scanning System	2 : 1 Interlace	
Horizontal Scanning Frequency	15.734 kHz	15.625kHz
Vertical Scanning Frequency	59.94 Hz	50 Hz
Image Sensor	1/4 Inch SONY Super HAD CCD	
Total Pixels	811(H) x 508(V) 410K	795(H) x 596(V) 470K
Effective Pixels	768(H) x 494(V) 380K	752(H) x 582(V) 440K
Horizontal Resolution	More than 480 TV lines	More than 480 TV lines
S/N Ratio	More than 48dB (AGC off)	More than 48dB (AGC off)
Lens	26x Zoom Video AF (F1.6(W), F3.8(T) f = 3.5~91.0mm)	
Minimum Illumination	Normal mode : Typical 1 Lux at 30IRE (AGC on) Night mode : 0 Lux (IR LED on)	
Synchronization	Internal / External(Line Lock) : Auto Detect	
Signal Output	1Vp-p Composite Output with 75Ω Terminated	
Supplied Voltage	DC 9V ~ 15V (Recommendation DC 12V ± 0.5V)	
Power Consumption	Max. 4.2W / 350mA	
Dimensions (WxHxD)	50.5 x 61.1 x 92.25mm	
Weight	Approx 340g	

260x zoom

COLOR VIDEO ZOOM CAMERA SERIES
DIGITAL SIGNAL PROCESSING

OWNER'S MANUAL

22x
16x
12x

POWER ZOOM
COLOR VIDEO CAMERA
DAY&NIGHT

. Model Description - 22x/ 16x/ 12x Series

Model	Type	Digital Zoom	DSS	Communication System	Video Out	Power Input
22x Series	A	x 220	O	PTZ Controller	BNC	DC 12V
	B	x 220	O	RS-232C	BNC	DC 12V
	C	x 220	O	RS-422/485	BNC	DC 12V
	D	x 220	X	PTZ Controller	BNC	DC 12V
	E	x 220	X	RS-232C	BNC	DC 12V
	F	x 220	X	RS-422/485	BNC	DC 12V
	G	x 220	X	RS-422/485	BNC	AC24V/DC12V
	H	x 220	X	RS-485	UTP/BNC	AC24V/DC12V
16x Series	A	x 128	X	PTZ Controller	BNC	DC 12V
	B	x 128	X	RS-232C	BNC	DC 12V
	C	x 128	X	RS-422/485	BNC	DC 12V
12x Series	A	x 120	O	PTZ Controller	BNC	DC 12V
	B	x 120	O	RS-232C	BNC	DC 12V
	C	x 120	O	RS-485	BNC	DC 12V
	D	x 120	X	PTZ Controller	BNC	DC 12V
	E	x 120	X	RS-232C	BNC	DC 12V
	F	x 120	X	RS-485	BNC	DC 12V

- Design and specifications are subject to change without notice.

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9. Menu Format Table 57

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. Features

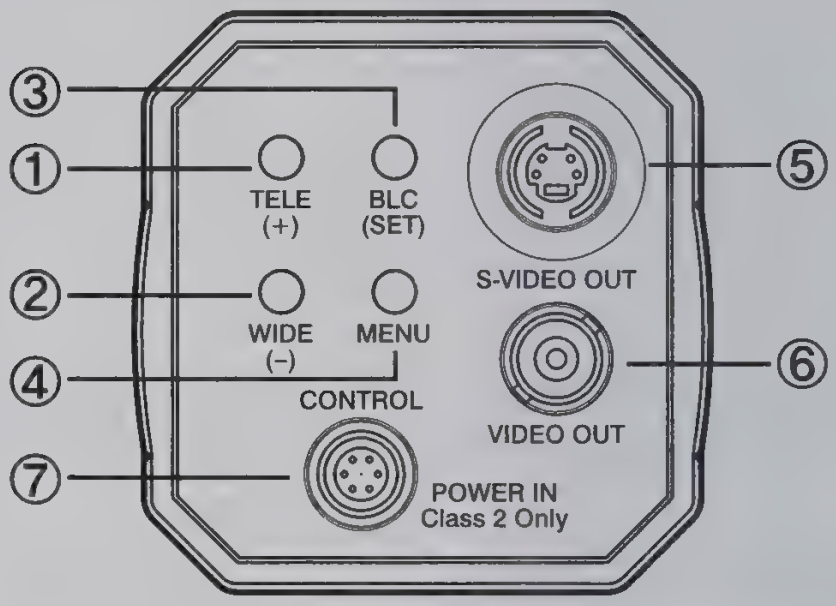
- DSP color camera for Pan / Tilt / Zoom Control
  - 22x Zoom & 16x Zoom (Options : RS-232C, RS-422/ 485)
  - 12x Zoom (Options : RS-232C, RS-485)
- High Durability Built-in 22x Zoom & 16x Zoom & 12x Zoom
  - 22x Zoom (Optical : 22x, Digital : 10x)
  - 16x Zoom (Optical : 16x, Digital : 8x)
  - 12x Zoom (Optical : 12x, Digital : 10x)
- High-Resolution 1/4 inch Color CCD pick-up (22x & 16x Zoom)
  High-Resolution 1/3 inch Color CCD pick-up (12x Zoom)
- Fuzzy Picture Control with Advance DSP
- Powerful Auto Focus
- OSD (on-screen display) Function
- Wire remote controller (Option)

- *Digital Slow Sutter for Full color surveillance under very low light condition : 0.01 Lux (at x 128 Field)*
- *Day & Night Function : 0.1 Lux*

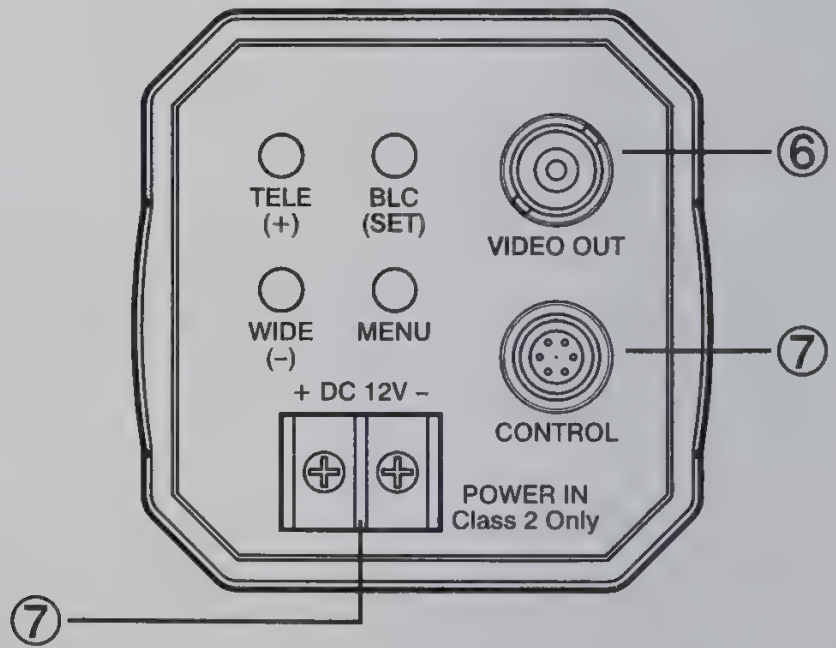
● *: Day & Night Model --> 22x Series*
12x Series

. Control Names and Locations - 22x Series(DC 12V)

<Controller Model>

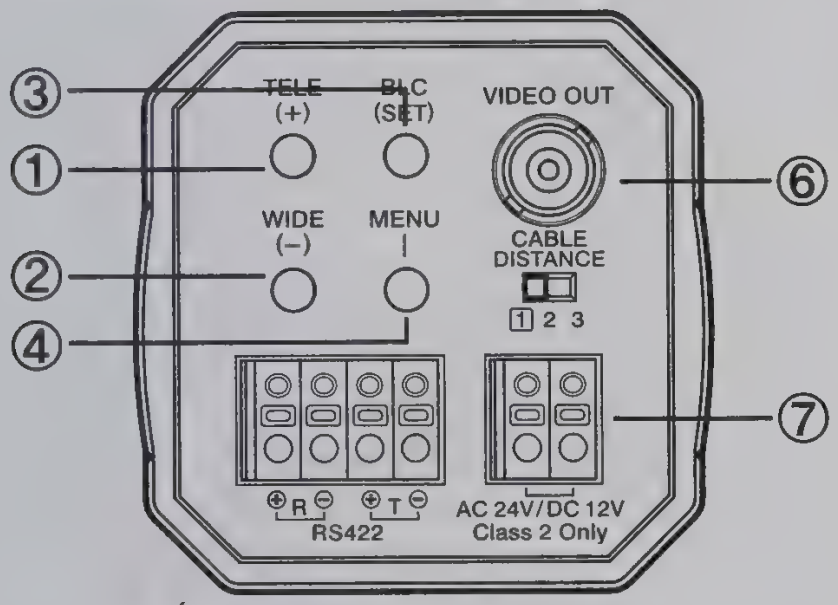


<RS-232C/ RS-422/ 485 Communication Model>

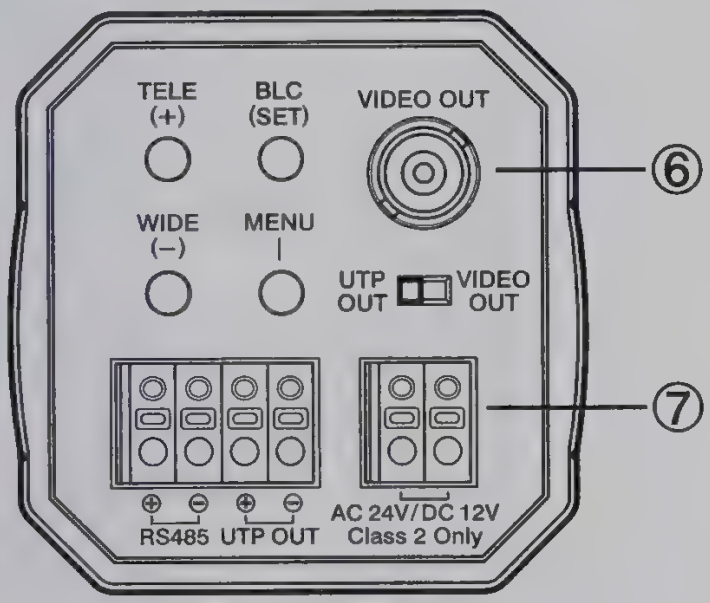


. Control Names and Locations - 22x Series(AC 24V)

<RS-422 Communication Model>

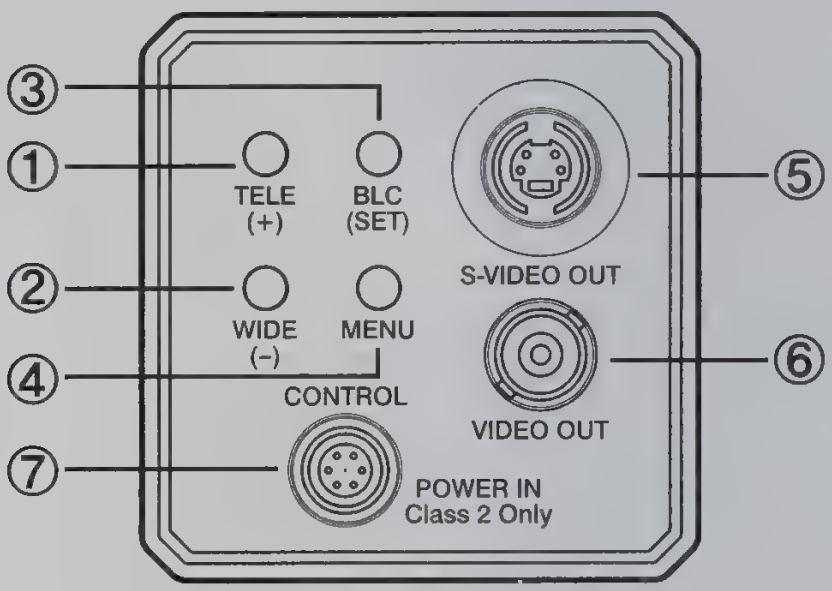


<UTP Video Out/ RS-485 Communication Model>

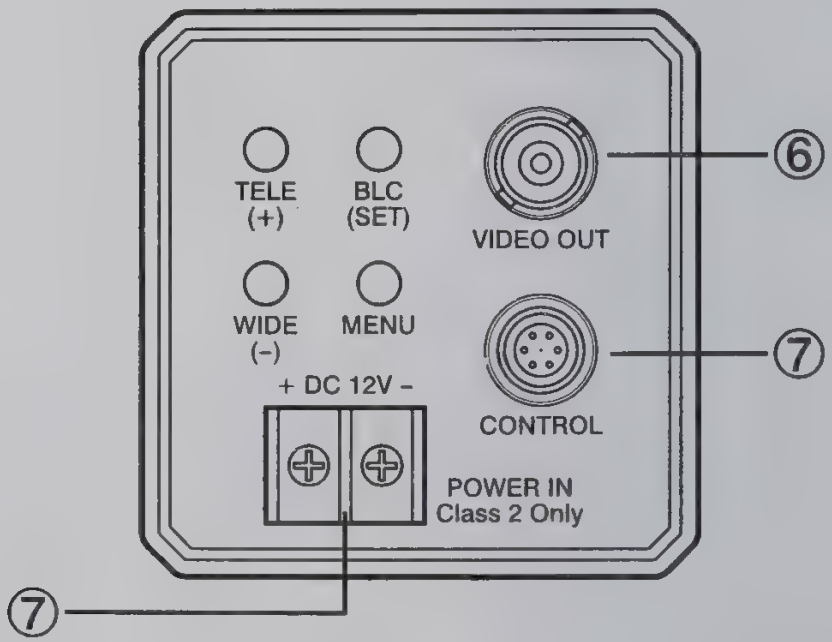


. Control Names and Locations - 16x Series(DC 12V)

<Controller Model>

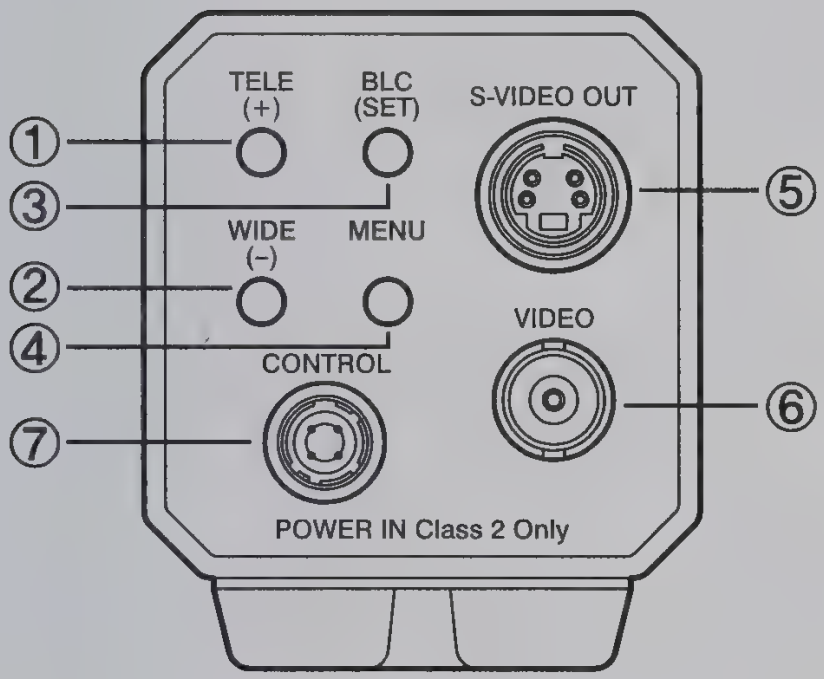


<RS-232C/ RS-422/ 485 Communication Model>



. Control Names and Locations - 12x Series

<Controller RS-232C/ RS-485 Model>

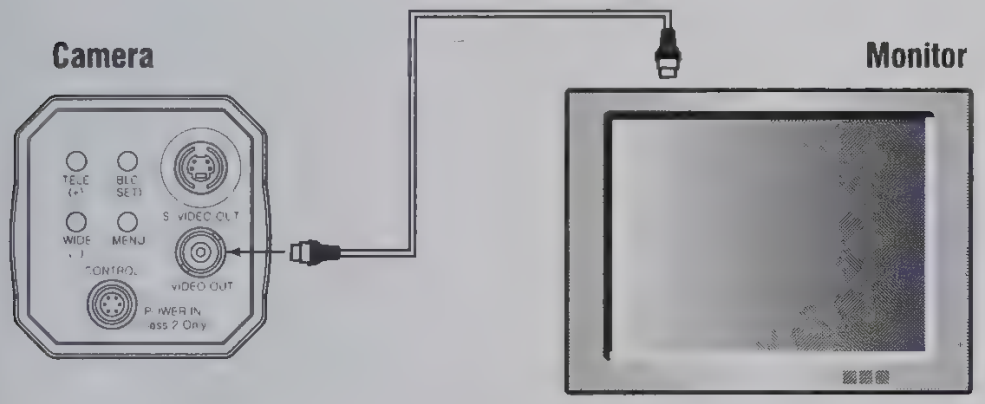


. Control Function

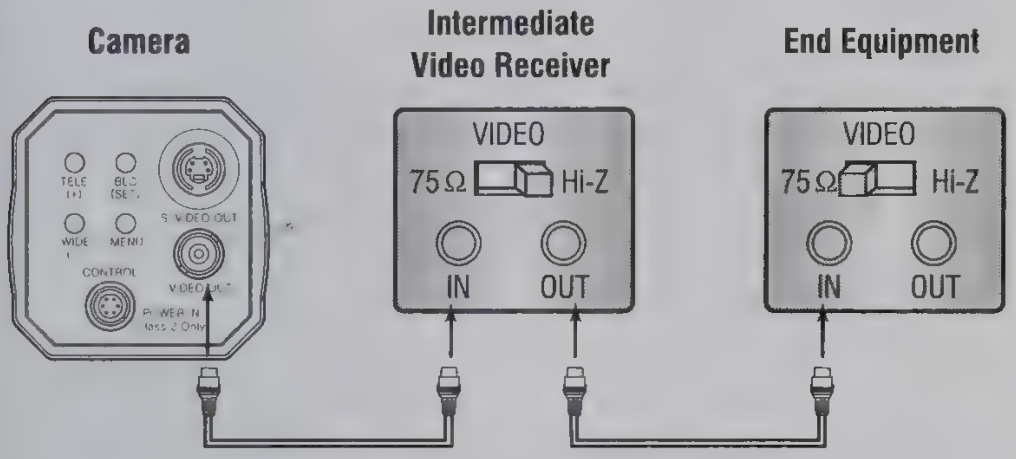
NO.	NAME	FUNCTION
1	**TELE(+)**	Press TELE (Telephoto) to zoom in. This button is used for UP in the Menu mode.
2	**WIDE(–)**	Press WIDE (Wide Angle) to zoom out. This button is used for DOWN in the Menu mode.
3	**BLC(SET)**	BLC mode is switched between ON and OFF by pressing this button. - If you keep pressing this button over 2 seconds and release, the BLC mode will be changed to AUTO BLC mode. **(A.BL)** - This button is used for SET in the menu.
4	**MENU**	Press Menu to display OSD. - If you keep pressing MENU over 2 seconds, OSD will be off. Menu mode will be displayed again once Menu is pressed.
5	**S-VIDEO OUT**	This is an output terminal for separate Y/C video signals.
6	**VIDEO OUT**	Connect this terminal to the video input terminal or an external unit such as a monitor, TV, Time lapse VCR, multiplexer, swicher etc.
7	**POWER IN and CONTROL**	Insert the DC power cable here to connect the camera to the DC power source(DC 12V). You can control the Zoom and Focus Lens by using PT/Zoom controller.

■ Connecting to Monitor (BNC Video Out)

Connect the video output terminal on the back of the product to the monitor.



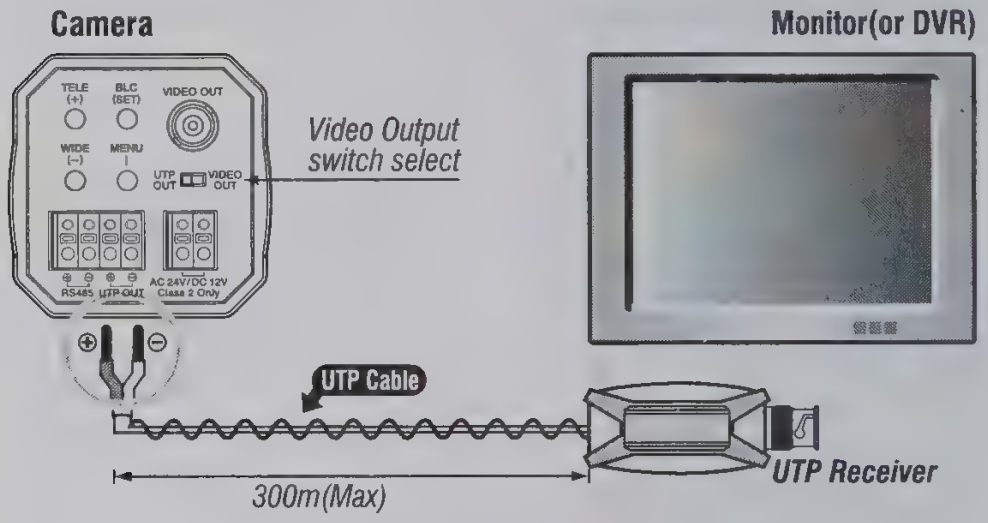
- The method of connecting the camera to a monitor varies depending on the model. Please refer to the manual for your model.
- Connect the camera after switching off each piece of equipment.
- Change the 75Ω/Hi-Z conversion switch of each piece of equipment according to the following diagram- move the switch of the intermediate video receiver to Hi-Z, and the end equipment to 75Ω.



- Connect the S-Video terminal to a color monitor.
- Connect the camera's S-Video output to the monitor's S-Video input terminal using the S-Video cable.
- Set the monitor's S-Video 75Ω switch to ON.

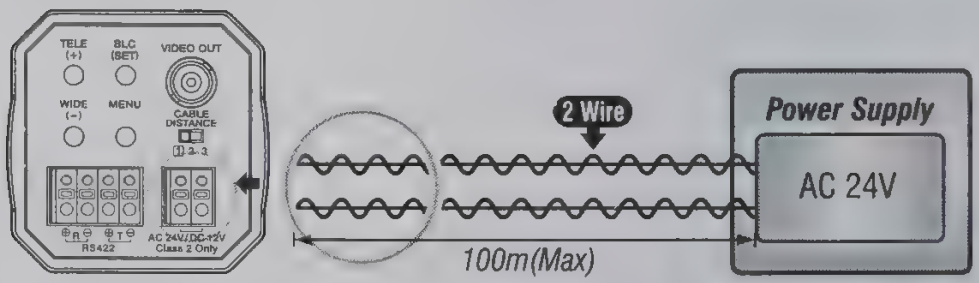
■ Connecting to Monitor / DVR (UTP Video Output)

Connect the UTP video output terminal on the back of the product to the monitor.



- When using UTP video output, set "select switch" at the "UTP OUT".
- When the distance is far from camera to monitor, set "select switch" in the middle. The picture will show a better image.
- Connect UTP (Unshielded Twisted Pair) wire to the UTP output of the camera directly. UTP transmitter is included in the camera therefore additional UTP transmitter is not necessary.
- UTP receiver is necessary to connect UTP wire to Monitor or DVR.
- When connecting UTP wire, make sure the polarity of the video signal.
- Use UTP wire "CAT5 24AWG" to have the best transmission quality.

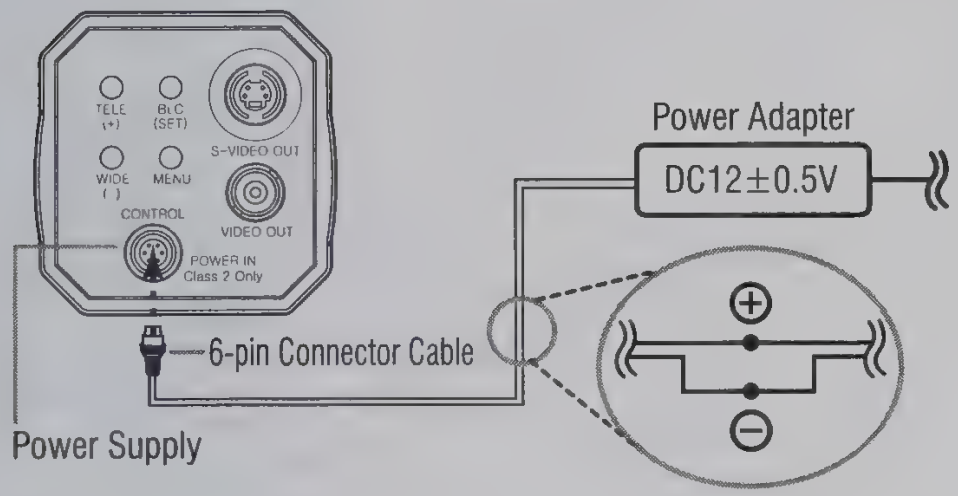
■ Connecting Power / (For UTP Video out Model)



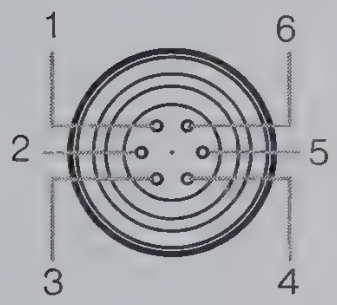
- When using AC 24V power, it is possible to supply the power within 100m.
- Use 4 wires by 2 pair of wires.
- When using DC 12V power, UTP wire can not be used for power line.

■ Connecting Power (For Controller Model)

Connect Pin 5 (Black: GND) and Pin 6 (Red: DC12V) of the 6-pin connector cable to the output of power adapter according to the following diagram.



• **Pin Configuration of 6-pin Circular Connector**



[6-pin Circular Connector Pins]

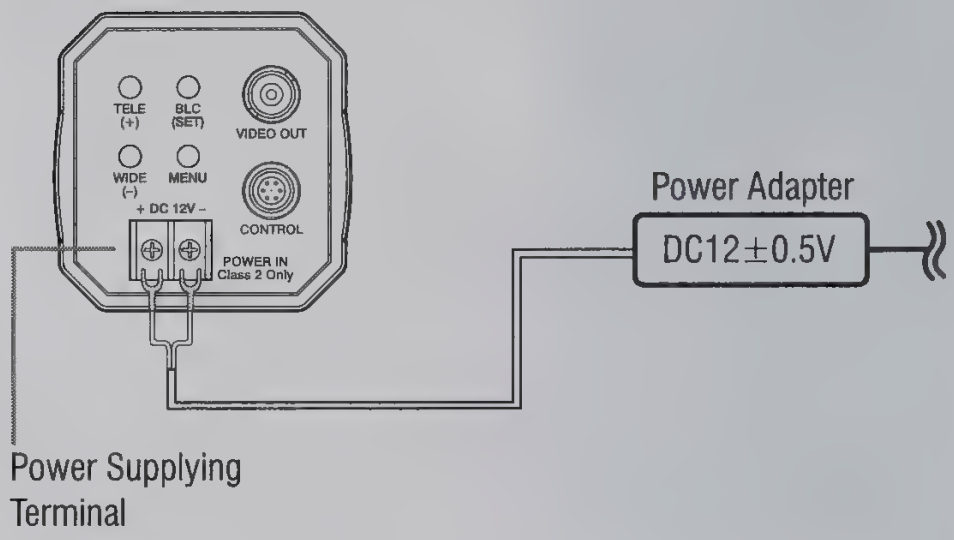
Pin. No	Color
1	Green
2	White
3	Brown/Blue
4	Yellow
5	Black
6	Red

Caution

- When connecting to the power source, make sure the polarity of the power adapter is correct.
- Connect power only after installation has been completed.
- AC adapter is sold separately.

■ Connecting Power
(For RS-232C/ RS-422 Communication Model)

Connect the AC adapter output to the power input terminal of the camera according to the following diagram.



Caution

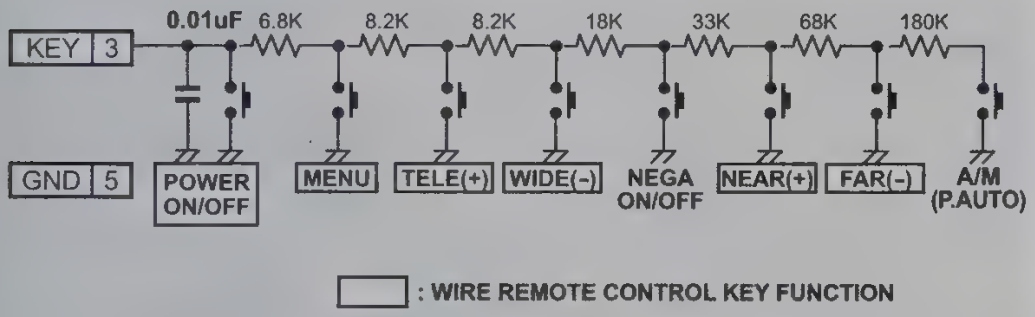
- When connecting to the power source, make sure the polarity of the power adapter is correct.
- Connect power only after installation has been completed.
- AC adapter is sold separately.

■ Connecting 6-pin Connector (For Controller Model)

Pin.No.	NAME	I/O	Color	Note
1	ZOOM (+:Tele, -:Wide)	Input	Green	±6V(Limit +3~13V, -3~-13V)
2	FOCUS (+:Near, -:Far)	Input	White	±6V(Limit +3~13V, -3~-13V)
3	KEY	Input	Brown	or Blue
4	COM(For Zoom, Focus)		Yellow	
5	GND (For Power)		Black	
6	DC IN	Input	Red	DC 12±0.5V

Link pins 1, 2, and 4 as in the above table,
when using pan/tilt, zoom controller.

- **Connecting KEY:**
  The following KEY circuit can be configured and used.



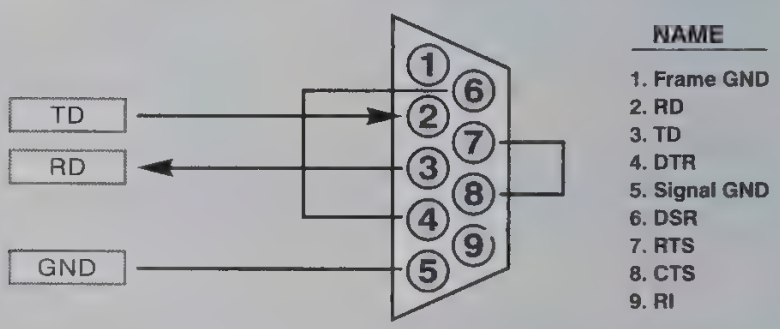
- The 6-pin connector can be controlled by connecting the external wired remote control.
- An optional external wired remote controller is provided.
- There are two types of external wired remote controller- 1.5m and 30m.

■ Connecting 6-pin Connector (For RS-232C Model)

Pin.No.	Zoom	NAME	I/O	Color	Note
1	22x/16x	RD (For RS-232C)	Input	Green	
	12x				
2	22x/16x	TD (For RS-232C)	Output	White	
	12x				
3	22x/16x	KEY	Input	Brown	or Blue
	12x				
4	22x/16x	GND		Yellow	
	12x	Line IN	Input		
5	22x/16x	GND (For Power)		Black	
	12x	GND			
6	22x/16x	Line IN	Input	Red	EX. VD (Negative. 5Vp-p)
	12x	DC IN			DC 12±0.5V

- RS-232C communication model can be controlled by connecting pins 1, 2 and 4 to the PC as shown in the above table.
- The operating S/W is not provided. Configure the S/W using the protocol provided by our company.

• Connecting to PC



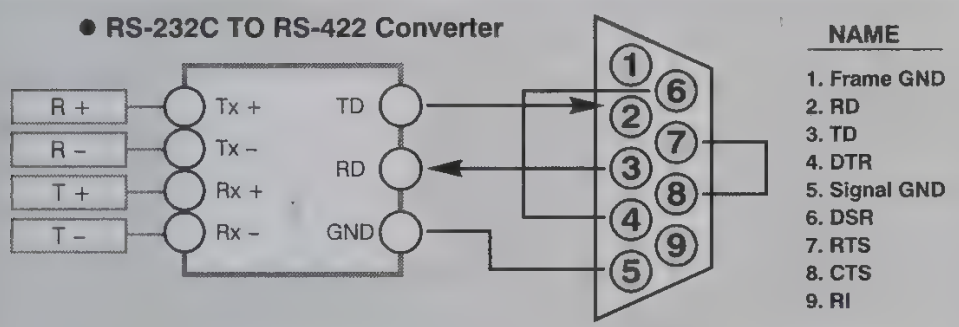
● RS-232C D-Sub Connector

■ Connecting 6-pin Connector (For RS-422 Model/ RS-485 Model)

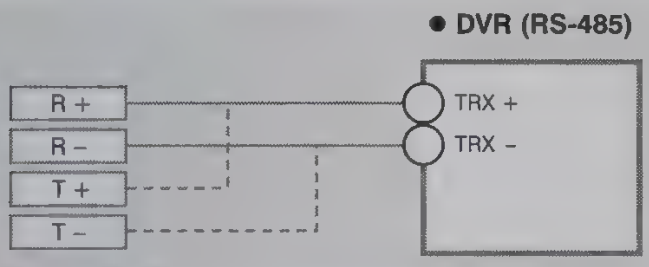
Pin.No.	Zoom	NAME	I/O	Color	Note
1	22x/16x	R+	Input	Green	
	12x	RTX+			
2	22x/16x	R-	Input	White	
	12x	RTX+			
3	22x/16x	T+	Output	Brown	or Blue
	12x	KEY	Input		
4	22x/16x	T-	Output	Yellow	
	12x	Line IN	Input		
5	22x/16x	GND		Black	
	12x				
6	22x/16x	Line IN	Input	Red	EX. VD (Negative. 5Vp-p)
	12x	DC IN			DC 12±0.5V

- RS-422 communications model can be used by connecting pins 1, 2, 3 and 4 in the following diagram.
- The operating S/W is not provided. Configure the S/W using the protocol provided by our company.

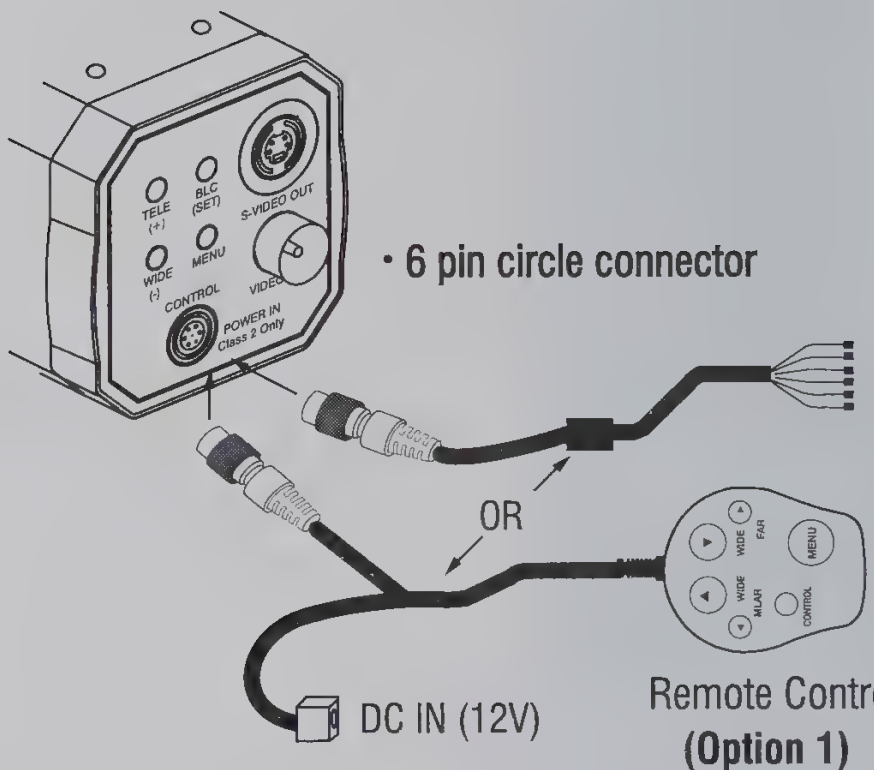
• Connecting to PC (RS-422 Communication)

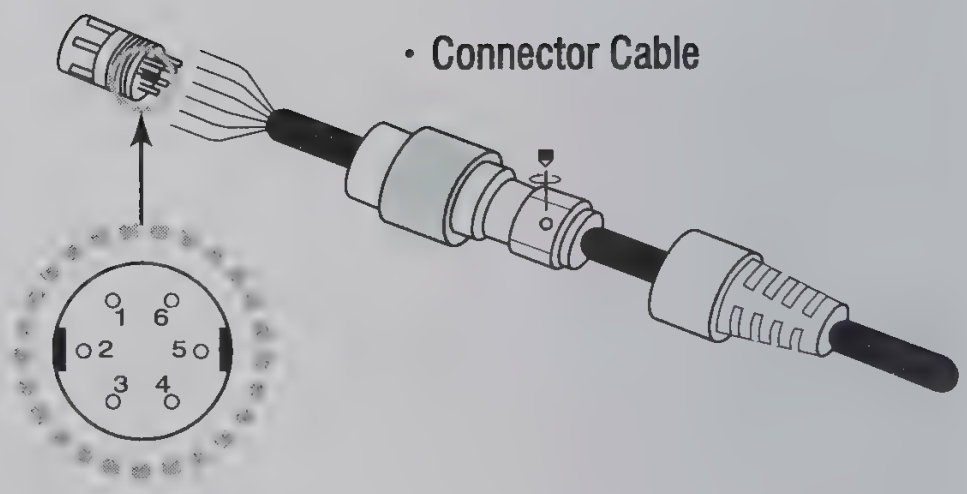


• Connecting to DVR (RS-485)



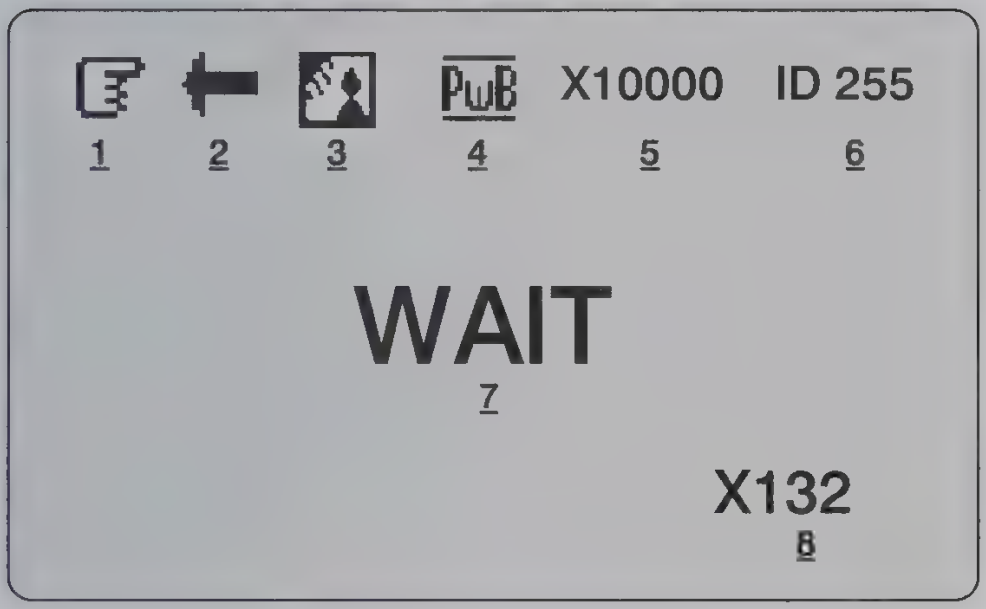
. Connection Diagram (Optional)



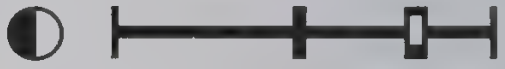


■ Explanation of the On-Screen Display

The OSD (On Screen Display) is as follows:



1. **Focus**
   The ☞ appear during the focus manual mode.
2. **Mirror**
   When IMAGE MIRROR is ON state. The image is displayed in the opposite direction. The ⬅ appear during the mirror mode.
3. **Back light Display**
   In case the excessive light is behind the center object, it is necessary to prevent the center object from too much darkness. Turn the BACK LIGHT ON, then the center object is not influenced by the back light. AUTO BLC can be displayed by pressing BLC(SET) over 2 seconds.
4. **WBC(White Balance Control) Display**
   See Page 58.
5. **Shutter Speed**
   Use to select the shutter speed 14.
6. **Camera ID Display**
   See Page 58.
7. **Wait Mode**
   Indicates the camera stand-by mode until the camera power turns on.
8. **Example of Zoom, Brightness, Sharpness Display**
   See Page 58.

	FUNCTION	OSD Format	DESCRIPTION
1	Focus Mode	Non display	Focus Auto Mode
			Focus Manual Mode
2	Mirror Mode	Non display	Mirror Mode OFF
			Mirror Mode ON
3	Back Light	Non display	Back Light OFF
			Back Light ON
		A.	Auto Back Light ON
4	WBC Mode	Non display	White Balance AUTO
		PuB	Push Auto White Balance: In this mode "Menu key" pressed, the white point traced automatically (PWB Auto Mode), "Menu Key" released, the white point preserved currently (PWB Manual Mode).
5	Shutter Speed	Non display 1 / 125 ⋮ 1 / 10000	Normal Shutter (NTSC:1/60 PAL:1/50) 8 variable.
6	Camera ID	After input the Identification Number to each camera, Multi-point control is available. (000~255)	
7	Wait Mode	Wait	Indicates the camera stand-by mode. until the camera power turns ON.
8	Zoom Display	**x15** ; In case of 22x Zoom (12x Zoom) ; Optical Zoom only mode ; (Current Zoom:x15) **x32** ; In case of 44x Zoom ; Digital Zoom x 2 mode ; (Current Zoom:x32) **x150** ; In case of 220x Zoom (120x Zoom) ; Digital Zoom x 10 mode ; (Current Zoom:x150)	
8.1	Sharpness Adjustment Mode Display	SHP x10	
8.2	Brightness Adjustment Mode Display	 x18	

. Menu Format

1). General Model

```
MENU
   1 IMAGE MIRROR   OFF
☞  2 NEG / POS      POS
   3 COLOR          ON
   4 WB CONTROL     AUTO
   5 SHUTTER        1/10000
   6 CAMERA ID      123
```

```
MENU
   7 ZOOM START     1
   8 ZOOM STOP      220
   9 BRIGHTNESS     48
  10 SHARPNESS      10
  11 FOCUS          AUTO
  12 INIT SET       ON
     END
```

2). Day & Night Model

```
MENU
   1 IMAGE MIRROR   OFF
☞  2 SLOW SHUTTER   FLD24
   3 DAY/NIGHT      OFF
   4 WB CONTROL     AUTO
   5 SHUTTER        1/10000
   6 CAMERA ID      123
```

```
MENU
   7 ZOOM START     1
   8 ZOOM STOP      220
   9 BRIGHTNESS     48
  10 SHARPNESS      10
  11 FOCUS          AUTO
  12 INIT SET       ON
     END
```

■ Setting the MENU

The buttons for setting are on the MENU mode [Using **TELE (+)**, **WIDE (–)**, **BLC(SET)**button] **TELE (+)** and **WIDE (–)** are used for UP and DOWN. To change the item (from left to right to left) at the selected number, Press the BLC(SET) button. **TELE (+)** and **WIDE (–)** are also used for Increase and Decrease of data.

1). MENU
Press Menu to display Menu mode and press Menu again to escape from Menu mode.

2). PUSH AUTO
Press BLC(SET) at the WB CONTROL (4) or FOCUS (11) and choose PUSH AUTO by using
TELE or WIDE, then keep pressing Menu Key for tracing automatically White Balance & focus.

3). Exit Menu
Press BLC(SET), and then press Menu to escape from Menu mode.

. Menu Format Table

✔ : Day&Night Model

NO	NAME	FUNCTION
1	**IMAGE MIRROR**	When IMAGE MIRROR is ON, the image is displayed in the opposite direction.
2	**NEG / POS**	Use to change NEGATIVE and POSITIVE mode. ON : NEGATIVE mode OFF : POSITIVE mode
	SLOW SHUTTER ✔	Use under very low light condition for full color surveillance. OFF——>FLD2——>————>FLD128
3	**COLOR**	Use the change color and monochrome of picture. ON : Color mode OFF : Black and White mode
	DAY & NIGHT ✔	Use under low light condition for continuous surveillance. Auto——>ON——>OFF
4	**WB CONTROL**	▪ AUTO : Maintain best color condition by controlling the change of color automatically. WB Range 2800°K ~ 8000°K ▪ PUSH AUTO(PWB) : Can find White Balance exactly in case precise WB maintenance is needed under any environment. --Turn the AUTO mode, WB acts automatically. --Turn the PUSH AUTO mode, WB doesn't act.
5	**SHUTTER**	Use to select the shutter speed 8 steps. NORMAL(NTSC:1/60, PAL:1/50),1/125,1/250,---,1/10000
6	**CAMERA ID**	To connect a large number of camera, identification number can be assigned to each camera control easily. (OFF, 1-255 : total number of ID is 256) **CAUTION** : Set the ID number of camera, then the ID number is displayed continuously.
7	**ZOOM START**	Use to change the zoom start position.
8	**ZOOM STOP**	Use to change the zoom stop position.
9	**BRIGHTNESS**	Use to change the brightness of scene (0~48).
10	**SHARPNESS**	Use to change the contour of scene (0~15).
11	**FOCUS**	AUTO : Set the focus mode to Auto mode. PUSH AUTO : Set the focus mode to Push Auto mode.
12	**INIT SET**	Set the initial mode ON, the changed data are renewed. Reset the data to its shipping condition.

. Specifications - Model (NTSC)

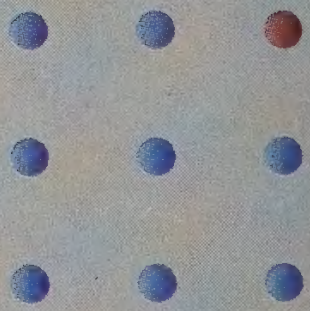
Model (NTSC)	22x Series	16x Series	12x Series
Signal System	NTSC : 525 Lines		
Scanning System	2 : 1 Interlace		
Scanning Frequency(H)	15.734 kHz		
Scanning Frequency(V)	59.94 Hz		
Image Sensor	1/4 inch SONY Super HAD CCD		1/3 inch SONY Super HAD CCD
Effective Pixels Number	768(H) x 494(V) [Normal : 510 (H) x 492(V)]		
S/N Ratio	More Than 48dB (AGC Off)		
Resolution	Horizontal : 480 TV Lines [Normal : 380 TV Lines]		
Video Output Level	1.0 Vp-p (75 Ohms, composite)		
Lens	22x (F1.6, f=3.9~85.8mm)	16x (F1.4, f=4.0~64.0mm)	12x (F1.8, f=5.4~64.8mm)
Digital Zoom Ratio	10x (Total zoom Ratio : 220x)	8x (Total zoom Ratio : 128x)	10x (Total zoom Ratio : 120x)
Min. Shooting Distance	1 cm (Wide) / 1 meter (Tele)		10cm(Wide)/ ∞~0.8meter(Tele)
Min. Illumination	1.0 Lux (30 IRE), 0.01 Lux (Day & Night Model)		
Sync. System	Internal		
OSD(On Screen Display)	On / Off		
Shutter Speed (8 Steps)	1/60 ~ 1/10,000 Sec.		
Input/ Output Connector	Control, Power : 6 Pin circle connector / Video Output : BNC		
Power Consumption	DC 12V (DC 9V~15V), Max. 4.2W / 350mA		
(Option: AC24V/DC12V)	AC 24V (20V~28V) or DC 12V (10V~15V), Max 6W/ 0.5A		
Dimensions (WxHxD)	60 x 60.3 x 101.1 mm	58 x 59.8 x 99.3 mm	52 x 53 x 96.6 mm
Weight	Approx. 345g	Approx. 330g	Approx. 325g

. Specifications - Model (PAL)

Model (PAL)	22x Series	16x Series	12x Series
Signal System	NTSC : 625 Lines		
Scanning System	2 : 1 Interlace		
Scanning Frequency(H)	15.625 kHz		
Scanning Frequency(V)	50 Hz		
Image Sensor	1/4 inch SONY Super HAD CCD		1/3 inch SONY Super HAD CCD
Effective Pixels Number	752(H) x 582(V) [Normal : 500 (H) x 582(V)]		
S/N Ratio	More Than 48dB (AGC Off)		
Resolution	Horizontal : 480 TV Lines [Normal : 380 TV Lines]		
Video Output Level	1.0 Vp-p (75 Ohms, composite)		
Lens	22x (F1.6, f=3.9~85.8mm)	16x (F1.4, f=4.0~64.0mm)	12x (F1.8, f=5.4~64.8mm)
Digital Zoom Ratio	10x (Total zoom Ratio : 220x)	8x (Total zoom Ratio : 128x)	10x (Total zoom Ratio : 120x)
Min. Shooting Distance	1 cm (Wide) / 1 meter (Tele)		10cm(Wide)/ ∞~0.8meter(Tele)
Min. Illumination	1.0 Lux (30 IRE), 0.01 Lux (Day & Night Model)		
Sync. System	Internal		
OSD(On Screen Display)	On / Off		
Shutter Speed (8 Steps)	1/50 ~ 1/10,000 Sec.		
Input/ Output Connector	Control, Power : 6 Pin circle connector / Video Output : BNC		
Power Consumption	DC 12V (DC 9V~15V), Max. 4.2W / 350mA		
(Option: AC24V/DC12V)	AC 24V (20V~28V) or DC 12V (10V~15V), Max 6W/ 0.5A		
Dimensions (WxHxD)	60 x 60.3 x 101.1 mm	58 x 59.8 x 99.3 mm	52 x 53 x 96.6 mm
Weight	Approx. 345g	Approx. 330g	Approx. 325g

. Memo

. Digital Zoom Camera Series



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Color Zoom Camera Series

- Design and specifications are subject to change without notice.